The Journal of the American Medical Association

VOL. XX. CHICAGO, JANUARY 28, 1893. No. 4.

ORIGINAL ARTICLES.

ON THE ABSENCE OF COW'S MILK FROM JAPAN: ITS BENEFICIAL CONSEQUENCES.

Read in the Section of Diseases of Children, at the Forty-third Annual Meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY ALBERT S. ASHMEAD, M.D.,

OF NEW YORK.

One of the most striking features of that most curious of countries, Japan, is the singular scarcity of domestic animals. There you will never find the fields dotted with oxen or horses drawing the plough, for the Japanese are hardly acquainted with that time-honored tool and symbol of agriculture. Even to serve under the saddle does not come natural somehow to the Japanese horse—"a grudging, ungenerous animal, trying to human patience, with three movements (not by any means to be confounded with paces), a drag, a roll and a scramble."[1] Horses and cows are only seen in cities and on the roads, as pack animals; there are no pastures sweet. Silence is here really a striking, magnificent feature of the *rus beatum*. The cone-shaped Mystic Fusiyama rises, dimly seen, in the midst of an awful quietness. No lowing herds wind o'er the lea; the barnyard fowl's is almost a voice *clamantis in deserto;* he reminds the farmer, but only in the morning, that even under these stagnant circumstances, time flies. Here and there, however, a dog howls; that is all. The animal life of the land is set apart, concentrated and taken care of, as in a kind of common preserve, general park or reservation in the interior of the land, where it browses and prances and bellows and reproduces itself, contaminating as little as possible that high type of Eastern humanity which is now making ready for the baptism of Western civilization. But let it be said in passing, what the European in Japanese fields misses, I believe, more than anything else, is

> "The music of those silver bells,
> Falling at intervals upon the ear,
> With cadence sweet."

I intend here only to speak of one of the consequences of this quaint absence of animal features, of something not poetical at all, but practical in the highest degree. The cow in Japan is not wanted for her milk; otherwise she would lift her voice more loudly in the landscape. Milk being an animal product, falls under the general condemnation which excludes everything that has pertained to a living body from the alimentation of man. Now, it is true, this latter rule has a strange exception, for the animals of the chase are eaten. Let us not shrug our shoulders at the apparent inconsistency; the Oriental mind understands itself. Thus it happens that, as Japan may not use cow's milk, the Japanese mothers are compelled by stress of circumstances to suckle their babes themselves—and these delicate dwarfs have become the most perfect, the most successful *Almæ Maters* of the world. Artificial lactation is altogether unknown. The children are suckled until the sixth year, and you may hear them ask for the breast in a language as correct as that of adults. But it must be said that the mother's milk is not the only food of the little Japanese. River fish enter for a large part into their diet; after the first year, some other elements of general alimentation are added to their bill of fare. But the mother's milk always remains the *plat de résistance*.

Nature and society have endowed this notable mother with some great and peculiar advantages. Here menstruation returns only a year and a half after birth. Moreover, rules dating back to time out of mind insure the young mother a long period of especial attention on the part of the husband and the whole household. The existence of the concubinate is also, strange as it may appear, a considerable relief to the Japanese matrons. All that must tell favorably on the health of the children. Even the infantile minds find themselves in a wholesome, pleasant medium. Nowhere are children so constantly, so lovingly taken care of. Japan, it has been said, is the very paradise of childhood. Nowhere are the adults so well qualified to enter into the nascent ideas of the infant, to play with him—for the nature of the Japanese contains an extraordinary proportion of simplicity and childishness. The principal food of the mothers is, besides the everlasting rice; fish, shells, seaweeds and other products of the sea. No wine or beer enters into the diet of a lactating woman.

The great reward which Japan reaps from this meritorious care of motherhood and childhood, is the absence of rachitism. All observers have referred to the fact, and to the absence of rachitic pelves which is the consequence of it; hardly any difficult confinement, and a very small percentage of deaths in childbirth. Now I think I am not wrong in affirming that the chief and central source of these great sanitary blessings is the absence of cow's milk.

It is a remarkable fact that Japan, which according to Dr. Brush ought to be exempt from tuberculosis, is very far from being so. It is probably well known to you that, according to this observer, tuberculosis passes from the cattle into the human organism. In Japan, this disease exists mainly in the upper classes, where evidently cow's milk has nothing to do with it, and where it is easily explained by a systematic custom of close intermarriage, a system of, according to our ideas, incestuous inbreeding, which has endured for many centuries. This is the same process by which the disease is developed in cattle, according to Dr. Brush. It seems therefore, that there is no

[1] Miss Bird, Unbeaten Tracks in Japan.

necessity of transmission, and that the human organism worked upon by the same causes, will show the same effects. Strange to say the mountaineers, who have the most intimate relation with the isolated Japanese cattle, on their breeding-ground, are practically free from tuberculosis. There is also an historic fact which goes much against Dr. Brush's theory. The cattle were introduced into Japan from China, in the third century, and tuberculosis is known to have existed there, in that same high bred class, from times immemorial. The aristocratic disease, tuberculosis, was certainly communicated to the common people through a very extensive concubinate. And I am equally convinced that it was the milk of the mothers that preserved the lower orders from destruction.

Thus it would appear that the absence of cow's milk, though not a blessing in the sense of Dr. Brush, has had, in another way, an exceedingly beneficial influence on the general health of the race.

Racial immunities or the natural resistance of a race to certain diseases, are, at least partly, transmitted by the mother's milk. It is thus, as I said, that this face is free from rachitism. And there is another privilege of the same kind transmitted through the milk to the suckling. The iodized seafoods, more especially sea-weeds, and the fats and oils of fishes, which have for so many centuries formed a considerable proportion of the diet of nursing mothers, have, without doubt, helped to build up the racial resistance to their national inheritance, syphilis and tuberculosis. In the case of tuberculosis this resistance is so efficient that even the child of a tuberculous mother, fed on what might be supposed to be tuberculous milk until the sixth year, in the majority of cases remains unaffected. Now, if a tuberculous cow's milk transmits the disease to the human organism, why should not this tuberculous mother's milk transmit it? Even we do not object to the suckling done by our own tuberculous women, which indeed extends generally over but one year; yet their offspring, for the most part, are unaffected by the disease, at least in childhood. Now it is more than likely that if there were a contagion through milk, its effects would be apparent in the children.

All these benefits would, of course, be cut off by the substitution of a foreign element for the natural means of transmission.

I have, while I was in Japan, conceived an idea, quite satisfactory at least to my own mind, of the manner in which the iodized food renders its great service to the Japanese race. It is generally supposed that the contagium of tuberculosis is communicated by the inhalation of particles of dried sputum, disseminated in the air. It is my firm conviction that this is not so. I believe that these germs of disease are swallowed with the saliva, and alter the nutrition through the chyle and mesenteric glands. In an organism fed directly or indirectly by iodized substances, the poison meets and is neutralized by its own antidote. The Japanese mother, as by an instinct, never kisses her child on the lips. Indeed, the whole institution of kissing is practically unknown in Japan (except in the sexual act). It is even formally condemned, because the Japanese *know* that the kiss is the carrier of tuberculosis and syphilis. I have no doubt but that the caresses of the sick have added enormously to our own statistics of tuberculosis, and have caused much of the mischief which Dr. Brush would attribute to cow's milk.

I do not know whether the following has struck any other observer, or if I am the first to call attention to it. There is another, an occult and insidious danger which Japan escapes by letting cow's milk alone. If they drank it, as we do, it is very probable that they would drink it as we do, *nolentes volentes*, mixed with a nobler fluid. Now, thanks to the rice plantations, the water of Japan is by no means *the best of things;* it is even the worst, for it is pregnant with typhoid germs, being continually polluted with human excrements, and swarming with the brood of the distoma. Total abstinence from cold-water—an inverted tee-totalism — has been the salvation of Japan. Water is only drunk boiled with tea; the boiling kills the typhoid germs and the eggs of the distoma.

4 King St., New York.

A CASE OF TUBERCULAR SYPHILIS.

From the Clinic of
JOHN V. SHOEMAKER, A.M., M.D.,
PROFESSOR OF SKIN AND VENEREAL DISEASES, IN THE MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA.

[REPORTED BY DR. GEO. HEWITT.]

Gentlemen:—Mr. S., 35 years of age, a stonemason by trade, was admitted to the Medico-Chirurgical Hospital, Dec. 15, 1892. In the year 1878, the patient contracted gonorrhœa. Being at that time of wild and reckless habits, addicted to drink, he was careless as regards treatment. As a consequence the disease was not readily cured and he suffered from it for at least four months. During this period he was not aware of any chancre upon the penis or elsewhere, nor does he remember any enlargement of the inguinal glands. He at length recovered from the gonorrhœa and remained in good health for ten years. For the last six years he has been strictly temperate. During the interval he never had any eruption upon his body except small papules which came out upon the face especially after he had been drinking. He does not know that he ever had any general eruption. He has been subject from boyhood to occasional attacks of sore throat. With this exception he has not experienced any difficulty in the mouth or throat. In November, 1888, he had a bad fall from a railroad car; he struck heavily upon the right hip and was rendered almost insensible. In the early autumn of 1889 he noticed a swelling over the tuberosity of the right ischium. At first it was very small, it enlarged very slowly, but finally attained the size of a pigeon's egg. Painless in the beginning, it ultimately caused him a great deal of suffering, particularly at night. On September 23, 1890, the swelling spontaneously opened, and gave exit to a considerable discharge. He was then confined to the house for twelve days and his attending physician trimmed away undermined or sloughing edges, and dusted the surface with iodoform. The ulcer, however, did not heal. A similar, though smaller, lesion had made its appearance upon the right buttock and had pursued the same course. On Feb. 7, 1891, the ulcerated areas upon both buttocks were excised and the edges of the wound drawn together by stiches. It was about five weeks after this operation before he was able to resume his work. He had not been at work more than three weeks before a third tumor made its appearance a little below the left clavicle near the costo-sternal articulation. Like the preceding swell-

ing, it was at first small and painless, grew slowly' at length became the seat of throbbing pain, and in August, 1891, spontaneously ruptured. About two weeks after it opened this lesion was also removed by the knife. Before he had completely recovered from the operation a patch of inflammation developed behind the left shoulder joint. The skin, in this instance, was not, in the beginning, elevated. Subsequently two distinct points of swelling appeared and followed the same course as those already described. This last lesion began about six months ago. The skin has now been broken for about a month.

In the summer of 1885 a barber, when cutting his hair, noticed a bald spot about the size of a dime, situated upon the right side of the head above the ear. He made applications of crude petroleum to this patch and new hair soon grew. But eighteen months ago his wife observed that his hair was again thinning in the same situation. As, however, he was then suffering from the cutaneous lesions, he paid no attention to the spot of baldness, which has continually increased, until it now extends from the ear to the parietal eminence. It is about two inches in diameter and of a roundish form. Upon the vertex, also, the hair is becoming quite thin.

The patient's voice has been husky for three weeks past, and he has had, during that period, a dry feeling in his throat. He has no pain in swallowing. He has never had any inflammatory trouble with his eyes.

During the progress of this malady he lost a good deal of flesh, and became quite weak. Except when he was detained in the house after the operations, he was able to work but came home so fatigued that he was obliged to go to bed at once. His appetite was not good for breakfast, but he generally ate a good supper. His appetite is now good and he has no marked indigestion. His bowels are regular. He has regained flesh and sleeps well.

Upon inspection I found a large depressed cicatrix above and just below the tuberosity of the right ischium. The two are connected by a linear scar, which begins about one inch above the upper cicatrix. At a nearly corresponding point on the left buttock is a large crucial shaped scar. On the front of the chest, extending from the sterno-clavicular articulation about one and one-half inch outward and about two inches inward, is an irregularly oval scar about one and one-half inch in extreme width. At the inner extremity of this lesion an induration, resembling keloid may be detected. This spot is somewhat painful when pressed. The surface of the scar in general is not abnormally sensitive but he is conscious of a sensation of weakness at that spot when he makes unusual exertion, as, *e.g.*, in lifting a heavy weight. On the back of the right arm, just above the axillary fold, is a deep ulcer about the size of a three cent piece. The edges are overhanging and of a dull red color. A little behind and below the ulcer is a medium sized patch of redness, which exhibits here and there a little crusting, and at its lower border a slight maceration of the epiderm, leaving the derma exposed.

Though the origin of this case seems for a long time to have been attributed to traumatism, yet it is doubtless of a syphilitic character. The history of the case, it is true, gives no direct information as regards primary infection but the slow progress of the lesions, their destructive course and their appearance testify to the nature of the affection.

Many patients are met with who freely admit the existence of a gonorrhœa, but are entirely ignorant of ever having had a chancre. It seems strange that a sore of such significance should be overlooked but we must remember the careless habits of many men, the apparently trifling character which the initial lesion often presents. Frequent intoxication, or semi-intoxication lends, as in this case, an element of uncertainty to the history. The man who brutalizes himself with drink is not very observant as regards his person. Large, freely suppurating, and multiple chancroids with a huge, inflammatory and painful bubo cannot be disregarded by the most careless. A gonorrhœa, by reason of the painful micturition which it entails in the acute stage, cannot fail to be recognized. A large ulcerated Hunterian chancre will, we may suppose, always be discovered. There are, however, cases of true infecting chancre which may be overlooked if careful observation be not made. What is known as the "superficial erosion" is of very harmless appearance to one ignorant of its nature. It is small, it does not furnish much secretion and it involves no great depth. It is characterized by parchment induration of the base when pinched up between the fingers, but this is a feature of which the patient is ignorant and which, in a hasty examination by the medical attendant, may readily pass unnoticed. Another form of chancre is still less likely to attract attention. I refer to the dry papule in which induration is present, but nothing more; the skin is intact and even the epiderm may be unaffected; in some cases a little superficial scaling takes place. To mere inspection nothing abnormal may appear. If, however, the lesion be grasped between the fingers, it is found to be of very firm consistence, and feels like a shot or split pea imbedded beneath the skin. I have on several occasions had the opportunity of demonstrating this variety of chancre in a patient who was totally unaware of its existence, but who was at the time suffering from sore throat and one of the earlier secondary rashes. The induration may remain for months before it subsides. A chancre located within the urethra may give rise to some discharge, which might be mistaken for gonorrhœa. Finally, the ganglionic enlargement which accompanies chancre may consist only of a chain of moderately enlarged, painless, or almost painless glands, which might escape careless examination.

For these reasons a patient may easily be misled and declare at a subsequent stage, with perfect truth, that he has never had a chancre. The physician, however, should not be so readily deceived. He should search intelligently for hidden sources of infection. It is equally reprehensible to content oneself with a cursory inspection of the penis, overlooking everything but an open lesion, or to go to the other extreme and carelessly denominate every open sore a chancre. In the one case a grave specific poison is permitted to lurk unsuspected within the organism; in the other a patient is needlessly drugged with mercurials to no avail, or rather to his positive detriment. Everyone should now be acquainted with the broad and fundamental distinction between simple and specific venereal disease, between chancroid and chancre, between a local and an infecting sore, between an acute and severe local process which goes no farther, and between the slow and comparatively insignificant initial lesion, which is

only the first expression of constitutional contamination. Chancroids are generally multiple, chancres are generally single; chancroids suppurate abundantly, chancres are comparatively dry, the chancroidal bubo suppurates, the syphilitic bubo is generally unattended by suppuration. Herpes of the genitals ought never to be confounded with chancre or even chancroid. Herpes is of frequent occurrence in the same individual, it comes on without reference to sexual congress, the lesions are evanescent and never produce any enlargement of the inguinal glands. There is, indeed, one form of the initial lesion of syphilis which might be pardonably mistaken for herpes progenitalis. It has been described under the form of "multiple herpetiform syphilitic chancre." This manifestation is, however, extremely rare. It may be distinguished from simple herpes by the absence of itching or burning, their deeper color and their chronicity.

The same inattention which leads a man to overlook the occurrence of a chancre renders it possible that secondary eruptions will escape his notice. The erythematous or the small papular syphiloderm are not infrequently detected by the physician in examing a patient unaware of their existence. Thus, it is by no means uncommon for cases to pursue a comparatively mild course for a number of years when some of the destructive lesions of late secondary or tertiary syphilis develop, to the amazement of the patient, when informed of their true nature. I can recall to mind numerous instances of sarcocele, caries, gummata and visceral syphilis totally devoid of any history of infection.

The only secondary manifestation of which I obtain any decided trace is the circumscribed patch of alopecia. The patient appears to be a man of ordinary intelligence and education, yet, in accordance with his habitual negligence it was only through the discovery of a barber that he became aware that his hair was falling out in a circumscribed patch. A limited area of baldness upon the side of the head would seem far more likely to attract a man's attention than the ordinary and slowly developing baldness of the vertex. Syphilitic alopecia is generally an early constitutional manifestation but, like other symptoms of the disease, it may be postponed. Although in the vast majority of cases we witness a regular evolution of symptoms in relation to form and time, yet in exceptional cases the manifestations distinctive of the secondary period may be postponed or may recur for years. On the other hand, the lesions of tertiary syphilis may appear prematurely during the secondary stage. No soreness of the scalp had, in the present case, preceded the loss of hair. The patient could not remember that he had been particularly subject to dandruff. This is the history of syphilitic alopecia, which is not, as a rule, dependent upon the presence of a syphilide of the scalp, but is due to insufficient nutrition of the hair-bulbs. The patient applied crude petroleum to the affected spot and after a time a new growth occurred. The stimulant affect of the fluid may have had an influence in promoting local nutrition, but syphilitic alopecia is seldom permanent, and the hair begins to grow again at the expiration of five or six months, even in the absence of any treatment. At a later period, when the general condition was seriously depressed, the baldness returned, and the denuded patch has attained a considerable dimension.

Traumatism undoubtedly has an effect in determining the localization of infectious processes. Depressed nutrition due to injury renders a part more amenable to the action of any toxic principles which may exist in the system. Schüller has clearly demonstrated in a series of careful experiments, the influence of traumatism on the localization of tuberculosis. Professor Verneuil has shown that a contusion occurring to a subject in whom syphilis is latent may be followed by indolent ulcerations which partake of all the characteristics of a syphilitic lesion. He has shown, moreover, that though these manifestations may first occur at the site of injury, they may subsequently develop in parts of the body more or less remote. In other words, any local injury may excite or precipitate an outbreak of syphilis in an individual in whom the disease was latent and perhaps unsuspected. The lesion may first occur at the point of injury, but may afterwards involve distant regions. This mode of manifestation corresponds to the history of the present case.

Upon two occasions an extensive area of ulceration was removed. Cicatrization took place but slowly, and the cicatrices are large, rough, thick, with a tendency to the production of a keloid condition. Observation has convinced me that the less the knife is used in this stage of syphilis the less is the destruction of tissue and the less extensive and disfiguring the scar which results. When the diagnosis is plain, surgical interference is seldom attempted, except in the first and last stage. Notwithstanding the advocacy of certain eminent authorities, excision of the chancre cannot be entirely relied upon as a method of preventing the evolution of constitutional phenomena. It is decidedly unadvisable to open gummata unless degeneration has taken place, their contents have become softened, fluctuation is marked and the overlying skin is reddened. In that event the contents may be evacuated by a small incision made at the most dependent part of the tumor. At an earlier stage constitutional treatment will cause absorption of the pathological material.

I arrived at a diagnosis of syphilis in this case by a process of exclusion. With what other diseases could it be confounded? What other constitutional affections give rise to such extensive ulcerations? Leprosy does this, but leprosy scarcely enters into our conception of any case developing in this region of country in an individual who has never resided in a country where leprosy prevails. Tuberculosis may invade the skin, but is not common in that tissue. Tubercular ulcers generally occur around mucocutaneous orifices they manifest no disposition to heal, generally coëxist with pulmonary tuberculosis or occur in those persons whose work bring them in contact with animals or cadavers. Lupus vulgaris gives rise to ulcers which might confuse the diagnosis, but lupus usually develops during early life, the tubercles of lupus are smaller than those of syphilis and pursue a more chronic course. The ulcers of lupus are more superficial and the discharge which they produce is more scanty than in tubercular syphilis. In epithelioma there is almost invariably but a single lesion, the ulcer bleeds at the slightest touch, its base is red and fungous and covered with a thin, sanguinolent or sero-purulent secretion. Epithelioma occurs in people of advancing years, it is painful almost from the beginning, and it manifests no disposition to recovery. Sarcoma of the

skin is usually a solitary growth, increases rapidly in size, generally recurs after extirpation. Ulcerated epithelioma usually proves fatal within a year or two, sarcoma within three or four years.

Having determined that the lesions are of a syphilitic nature the question next arises, what particular form of the disease do they represent? The history of the case, the appearance and situation of the lesions leave but little doubt as to this point. The earlier manifestations do not enter into the consideration of the case. The size and course of the lesions, together with the date of their appearance, narrows the distinction down to the syphilitic tubercle or gumma. Both these specific neoplasms begin as small, roundish, painless nodules, increase slowly in size and terminate either by absorption or ulceration. A cutaneous gumma usually attains a larger growth than the tubercle and is generally single. Tubercles are not numerous but are generally multiple. It is not unusual for several tubercles to form in the same neighborhood, and as they undergo their phases of development and retrograde metamorphosis they are apt to coalesce and form an ulcer of irregular and serpiginous outline. The ulcer produced by degeneration of a single tubercle is smaller than that caused by the breaking down of a gumma, but the coalescence of neighboring nodules may result in the formation of more extensive ulcers than a single gummatous ulcer. We cannot, consequently, depend entirely upon the size or the number of the ulcers, but evidence of this kind must be compared with the history of the case. This patient states that the swellings were, in the beginning, very small, that they enlarged slowly, that they were multiple. In examining his body the scars bear witness to the essential truth of his declarations. Not only so, but in the last developed lesion, namely, that upon the shoulder, the ulcer is one of moderate size and I detect several points in the vicinity at which syphilitic deposits have previously undergone degeneration. For these reasons I look upon the case as one of tubercular syphilis.

The distinction between the tubercle and superficial gumma is not very pronounced. Both are late lesions and may not make their appearance, as in this case, until ten years after primary infection. They are both situated in or beneath the skin, they both consist of an aggregation of round cells which eventually by compressing the capillaries of the part in which they are situated give rise to degeneration of themselves and the tissues by which they are surrounded. Cellular proliferation is an essential feature of the pathology of syphilis in all its stages. This fact negatives the ingenious theory of Mr. Jonathan Hutchinson, who likens the progress of syphilis to that of an exanthematic fever and the manifestations of the tertiary stage to the sequelæ which follow those affections. The coëxistence of secondary and tertiary symptoms, the tardy development of secondary lesions and the precocious appearance of tertiary phenomena are also arguments against this theory.

The treatment since admission has consisted in the administration of two fluidrachms of the syrup of hydriodic acid three times a day. He had previously been for some time upon the ordinary mixed treatment, which had not, however, seemed able to hold the disease in check. I, therefore, was not disposed to continue a course which had not been attended with marked success, and prescribed hydriodic acid which is an excellent means of introducing iodine into the system. The iodine is liberated within the organism, and is particularly energetic in the nascent form. Externally the infiltrated patch upon the shoulder has been anointed with a preparation of:

℞. Ungt. aq. rosæ
Ungt. zinc oxid āāʒss.
Aristol ʒi.
M. ft. Ungt.

A starch poultice has been applied every two or three days to the ulcer, which, in the meantime is kept packed with aristol. The aristol is retained in place by means of a piece of gauze, which is secured by a layer of styptic collodion.

Under this treatment a noticeable alteration has been already effected. The redness has lessened, the infiltration is disappearing, the surface of the ulcer manifests a more healthy appearance and has taken on reparative action.

NATIVE AFRICAN CHILD-MARRIAGE: ITS RELATION TO UTERINE DISEASE AND DIFFICULT PARTURITION.

BY ROBERT H. NASSAU, M.D., D.D.,

UNIVERSITY OF PENSYLVANIA, MISSIONARY OF THE AMERICAN BOARD, ETC.

The common impression that maternity is easy among nations uncivilized and consequently untrammeled by the restrictions of fashion and conventionality, is incorrect—certainly as to the tribes of Western Equatorial Africa. An acquaintance, based on a residence there of over thirty years, with native African customs and habits, has made it apparent to me that the sexual life of the native women is thereby marred, maternity made painful and often fatal, and diseases entailed that make their lives a burden. I have observed the following facts, which are fruitful sources of uterine disease and difficult parturition.

1. Women are taken in marriage at too early an age. Sexual connection is commonly had before the age of puperty.

Under the polygamous customs of the country, little girls, even in infancy, are bargained for with their parents by suitors, each running a race, trying who shall first complete the sum of money demanded by the parents as "dowry." That sum given, the successful suitor has a right at once to take the child to his own village, and add her as "little wife" to his harem. There she is the servant of the older wives. In her plays she sees lads of her own age whose lascivious advances please her more than the thought of sexual relations with the adult or perhaps aged man who has paid for her. Through the amorous plays of young people, few girls reach womanhood with their virginity unbroken. The polygamist owner of the child, aware of this, jealously decides that if the unripe fruit is to be plucked by any body, he will claim the first right. And he does. As all little boys and girls run almost perfectly nude, his quick, jealous eye observes the very first growth of hair in the axilla, and promptly assumes that there is an equal growth on the external genitals. *That* is, to the native, a diagnostic sign of fitness for sexual intercourse.

Should a betrothed girl have been allowed by her

polygamist owner, or even by a Christian monogamist, to remain a virgin till puberty, the first eruption of the menses is regarded, not as Nature's official proclamation of womanhood, and of her fitness for sexual access, but as a proof of unfaithfulness—as a sign that access had already been allowed to some lover; and her indignant owner demands that she at once take her place as his married wife.

2. There is no compatibility of age or temper. The girl's consent was not asked while the money negotiations were being carried on for her—a child in her mother's arms. There is no tender courtship, no gentle deference of a lover. Her owner's rôle is that of teacher or master, whose eye is always that of a jealous inspector. And the child responds with the trickery of a pupil, and the subterfuges of a slave. It is impossible that there should be conjugal affection or connubial happiness. Her own wishes and preferences are elsewhere. She clandestinely gratifies them. Her sexual life therefore really goes on under polyandry: the combined (enforced) association with her owner, the (preferred) association with her chosen secret lover, and the (required) connection with her owner's guests. This latter is a part of native African hospitality. The chief furnishes his guests (black and white) with food by day, and a bed and female companion at night. It is the custom of the country. The chief gets his return from his black friends when his turn comes to visit among them; and from white trader guests, by their liberal pay of cloth, beads, etc. The woman has no share in these, but she makes her own plea, and receives from the white man's generosity her own additional gifts. While prostitution is not known, in the form of women as street-walkers openly soliciting men, the house of the polygamist thus becomes, practically a brothel. He is willing to hire the honor of his women to any stranger for a night, or for a longer time to wife-less young men attached to his retinue, only so that the bargain is made with *himself*—the pay placed in *his* hands. He sets up the cry of injured husband only when he discovers some clandestine amour of any one of his women with some man of her own choice. This almost promiscuous intercourse breeds syphilitic disorder; a disease, however, which natives assert is not as virulent among themselves as it is when white depravity is superadded to their own.

A result of the early and promiscuous intercouse, as above described, is the common sterility among women, and impotence among men. Polygamy, arising originally from a desire for progeny, thus defeats itself.

3. Even when the young wife has become pregnant, the chances are against her babe's safe delivery. The probabilities are large that there will be miscarriage.

The physical works of the women are numerous and severe. On them fall not only the ordinary and proper cares of cooking, weaving mats, etc., etc.; but they are also the laborers in the plantations of cassava, plaintains, maize, yams, etc. The men recognize as their own share of plantation work, only the felling of the trees, in making the clearings in the forest. All works subsequent to that, the planting, weeding, watching at night against depredations of elephants, hippopotami, wild oxen, wild hogs, monkeys, etc., etc., are regarded as tasks of the women, who may be seen daily, trudging each morning to the plantation with empty baskets, and returning in the evening laden with burdens of plantain, cassava tubers, etc., a log of fire-wood, and a jug of spring-water. Pregnancy is not accepted as excuse from such labor; the strain of which coming on the muscles of the loins and sacrum, very frequently causes miscarriage, with its usual dangers of habitual abortion, uterine displacements, or entire sterility.

4. The prospect of maternity is welcomed by the young wives: for the women all cherish their babes affectionately (that is the only lasting affection that enters their lives): and they are given by their owners better position, in recognition of their having increased his importance as a father. The prospect is welcomed also by the woman's female relatives: for they also are to share in the increased honor of the family.

But their preparations for the event are wearying, harassing, and often injurious. The young, expectant mother is vexed with innumberable superstitions and prohibitions of what she must not do or eat; she must not look on a corpse, or a butchered animal, or indeed on any sight of blood: she must not eat certain meats, or certain parts of the animal: must not tie a knot, or drive a nail, etc., etc., lest all these cause her hard labor or close her womb. She must be dosed with decoctions, for months in advance, to insure an easy labor. Between prohibitions and requisitions and warnings, her mind is terrified at the possibilities before her, and she approaches her hour of trial weakened in body and spirit, and the hopeful morale for the struggle gone.

5. When parturition does begin, it is met with unskillful treatment. (*a*) The patient's hut is crowded with officious and curious female relatives, of old and young. All are volubly discussing probabilities, offering advice, and shouting directions. They know of the proper number of months to be counted for pregnancy, but they often mistake the probable day, and seize at once on even "false pains." *b*. The three stages of labor are not recognized. The patient is urged and even objurgated, during her cries of pain in the initial stage, and bidden to force down; her position for that purpose being changed from a recumbent to a sitting posture. *c*. Nature is interfered with by the pouring of hot, even scalding, water on the sacrum, under the idea that the convulsive recoil of the muscles will hasten the expulsive efforts of the womb. *d*. Severer treatment is resorted to, when the labor is long, by the rubbing into the back, and introduction into the vagina, of cayenne pepper. Even forcible enlargement of the vagina by the hand of a female (sometimes a male) doctor, is performed in a protracted labor, resulting in rupture of the perineum, or lateral rupture of the external genitals. *e*. When, finally, the babe is born, the mother is allowed no interval of rest. All the anxiety of the attendants is for the expulsion of the placenta. They properly recognize the importance of its expulsion, but give the patient no time to recover strength for the second struggle. The cutting of the cord is often delayed until the appearance of the placenta, the infant's feeble life dying out sometimes in the interval. *f*. An expedient of our civilization to aid in the extrusion of the placenta, *i.e.*, the placing of the new-born babe to its mother's breast, is not allowed. They have gotten hold of the half of two truths, and wrest them both to the injury of mother and child. They are

aware of the desirability of the babe's *pruging* away its meconium: they are aware also that the colostrum of the mother's breast is not *food*. They therefore give the child purgative medicines, and refuse it its mother's breast for three days, while the colostrum is being artificially squeezed out, the child meanwhile being fed on raw sugar-cane juice, or suckled on the watery milk of some aunt or grandmother. Many of the native women never "go dry." Fevered and "caked" breasts are a common result, with frightful mammary abscesses. My patience has often been tried when I have said to some of the old hags:—"Yes, *I* too know that colostrum is not *food*, but it *is* medicine—the very medicine the child needs as a purge, and which God has put in the mother's breast for that express purpose—which should promptly be extracted from her breast, and which can best be extracted by her child's lips. *g*. Native women are not bandaged for the support of the abdomen's post-natal, flaccid walls. They are expected to arise, perhaps, the very day of parturition, and resume their usual labors. Very common are uterine displacements, and subsequent sterility, which the polygamous father resents. He does not see why the woman who has born him one child should not bear him more. Her inability to do so, he punishes with neglect, unkindness, or severity.

h. An argument given by polygamists for the system is their assumed necessity for having additional women with whom to cohabit, while the one who has just become a mother is nursing her child. Children are not weaned till they are three or four, or even more, years of age. During this time the mother avoids sexual congress, on the plea that her milk may be "spoiled" for her babe, on whom she now lavishes her affection, having had none for the father. Yet that milk, in due time, becomes, thin, watery, and void of sufficient nutriment for the child that has developed most of its first set of teeth. The child loses its infantile chubbiness: becomes thin; and breaks out with eczema and other sores; and its joints become abnormally large.

Among the most common results of African child-marriage, I observed: 1. Rupture in the genital region, either from the little mother's bodily structures being not fully developed, or from outside force used in aid of parturition. 2. Displacements of the uterus. 3. Sterility. 4. Ovarian tumors. 5. Uterine ulcers. 6. Dysmenorrhœa and menorrhagia. 7. Premature loss of good looks, and early appearance of haggard old age.

THE QUALITY OF COMPRESSED AIR FOR SPRAYS AND INHALATIONS.

BY D. LICHTY, M.D.,
OF ROCKFORD, ILL.

Asepsis is now in the zenith of its usefulness and has demonstrated beyond controversy its beneficence to all unfortunates who have to experience the surgeon's dextrous touch or feel his keener blade; every newly made wound is carefully guarded against the ingress of air, of any kind, and quickly sealed against it; the surgeon, gynecologist or accoucheur goes about his work now, with a comfortable assurance that the painstaking physician must envy in conscious helplessness when he rocognizes the environment in which he must combat disease.

There is an avenue however, which for the introduction of disease and death growing germs has no parallel and no excuse for its existence, other than that it is here, and no one has protested against it.

The allusion made, is in regard to the *quality* of air usually used in the compressed air receivers of those who treat diseases of the nose, throat and lungs by this means; all the air pumps I have observed offered for sale or in physicians' offices—and I have taken special pains to see as many of them as possible, are situated on the floor of the doctor's office, in not an overclean corner from which the air is drawn into the pump and thence stored in the reservoir to be afterwards projected with a pressure of from fifteen to twenty pounds into the diseased larynx or pharynx of the innocent patron whose inflamed crypts are deep and open wells for the speedy reception, and successful propagation of any of the germ diseases; with just the right factors of moisture and heat to develop them all; or, if drawn into the deeper structure of the lungs to mingle with, or become a portion of the residuary air, a sufficient period would ensue before again exhaled, for the successful incubation of almost any germ, and a nidus for dangerous disease be formed.

To ease my conscience of this offense against my patients I had a mechanic of the Air Brush Co., of this city, at my suggestion, construct for me a small oscillating pump which is run by a one-eighth horse power electric motor, that draws the air from out of doors; first through a five inch funnel shaped chamber, whose open end is covered with wire gauze and its inside loosely packed with asbestos wool to make a complete filter; this filter chamber is fastened at the outside top of a window sash of an upstairs office, and is connected by a rubber tube, larger than would seem necessary—to reduce resistance to a minimum—to the inlet valve of the pump, and is thence, at the return of the piston, forced into the air receiver for future use; by this means all the air comes from outside, is filtered, and it is claimed, that cleaner air is obtained than by the pumps generally located on doctors' dusty office floors.

The mechanical difficulties necessary to adjust any air pump to a similar filter system are not great, or expensive; and it is hoped that the physician will be enabled to use as aseptic air to inhale or to spray diseased throats as the surgeon does to douche *his* patients' wounds.

A STUDY OF THE CHEYNE-STOKES RESPIRATION.

BY SAMUEL WOLFE, M.D.,
OF PHILADELPHIA, PENN.

The patient, aged 65, an employee of the City Gas Department had for many years, when exposed to breathing illuminating gas, in the pursuit of his occupation been subject to attacks during which he lost consciousness, but after a short period of half an hour or an hour recovered and was able to resume his work. About three weeks prior to the time when the present observation was made he had suffered from one of these attacks, of more than usual severity and duration, and immediately thereafter was confined to his room for four or five days, with urgent dyspnœa and severe bronchial symptoms. Later on there was continued cough, and great rest-

lessness, and threatened cardiac failure. After partial recovery he again relapsed with great dyspnœa, and gradually became delirious, and during a portion of the time apathetic and lethargic. The Cheyne-Stokes respiration then appeared accompanied by a pulse of 112, the temperature being normal. A cycle of respirations occupied 55 seconds there being 27 respirations. The period occupied by the rising respirations was 25 to 30 seconds by the declining respirations 15 seconds. The number in each of these phases was about the same—14, making the succession during the declining period nearly twice as rapid as during the rising period. The pause lasted from 10 to 15 seconds- In this phase there was no perceptible alteration in the rate or character of the cardiac action, and no alteration in the pupils. Coughing during the cycle, did not influence its duration, nor any of its intrinsic characters. When aroused from his somenolence, which could be easily effected, there was no change in the cycle, except that the phase of decline was lengthened by a few additional respirations, during which there were no chest movements, but air could be heard to enter the extreme lower parts of the lung in jerky momentary pumps. The pause was of course correspondingly shortened. Otherwise the pause was a period of absolute stillness, so far as respiratory sounds were concerned, but as already remarked the cardiac sounds were in no respect altered. The patient died ten days later. The breathing during the whole period was closely allied to the Cheyne-Stokes type, but at no time was it found as typical subsequent to the above observation, as at that time.

CAFFEINE AND THE QUESTION OF ITS ISOMERISM.

Read in the Section of Materia Medica and Pharmacy, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY ALBERT B. PRESCOTT, M.D.,
OF ANN ARBOR, MICH.

In chemistry, caffeine is a body of distinctive molecular character, the subject of active research within the past ten years. In physiology it is bound to be of increasing interest that caffeine, the chosen adjunct of food, holds a remarkable relation to uric acid, an excretory carrier of nitrogen. In dietetics it is of wide import that the beverage plants of the world owe their effects in great measure to caffeines. In pharmacognosy it is worthy of attention that uncertain combinations of caffeines are in medicinal use. In these several studies it is desirable to settle the chemical question, whether caffeine be capable of isomerism or not.

This is not a question that has been raised by chemists; nor is there at present any chemical evidence, that I am aware of, for so much as a suggestion of the isomerism of caffeine. Pharmacologists have virtually raised this question, though they have not defined it as one of isomerism. And there is a great extent of medical opinion and lay opinion that, whatever chemists may say, the alkaloid of coffee does not produce the same effect upon the nervous system that is produced by the alkaloid of tea. If this somewhat widespread opinion, though not well defined, be well grounded, the chemist ought to be able to account for it. On one point the chemist is clear, if there be a caffeine in tea in itself not of the same physiological effect as the caffeine in coffee, then these bodies are not chemically identical. Then, both being caffeines, that is, trimethyl xanthines, it follows that the one must be isomeric with the other. Before this point is reached, however, there is a great deal for chemical analysis to do, and something for pharmacology to do.

There are five beverage plants, growing in different quarters of the earth, all largely adopted into use by uninstructed man, as a restorative from fatigue and a stimulant with food, and each of these plants contains an abundance of the body named caffeine. The body has been found as a slight or inconstant constituent of a few other plants, all of them adjuncts of food.[1] It was found in coffee in 1821; in tea in 1827; in guarana in 1840; in the maté of Paraguay in 1843; and in the kola of South Africa in 1865. In1838 Jobst and Mülder declared theine to be identical with caffeine. As soon as an alkaloid was found in guarana, in maté and in kola, in each instance the body was reported to be caffeine, and there have been no chemical reports to the contrary. The names, theine and guaranine, have fallen into disuse, and no other name than caffeine has been given to the body derived from maté or kola.

This one body, from five vegetable sources, is one of strongly marked chemical character. It is clearly determinate in character, more so than the most of the alkaloids are, and a body built altogether unlike them. Indeed, it is well within the control of synthetic chemistry. It is liable to be put upon the market as an artificial product. As an artificial body, if properly purified, it should be not an imitation but a veritable reproduction of the natural article. It is becoming probable, however, that this body, the chief alkaloid of five plants, is not the only one existing in them. Traces, at least, of two or more homologues of caffeine have been found in certain teas. There is need of analysis for these homologues, as lesser constituents. The presence of alkaloids accompanying caffeine, as codeine accompanies morphine, is to be put out of the way. Then there will be a clear field for the question of isomerism between the chief alkaloid of one beverage plant and the chief alkaloid of another, such as the difference between atropine and hyoscyamine.

As to the isomerism of caffeines, its probability can be denied only by full study of all research hitherto done on the molecular constitution of this group of bodies. The possibilities of isomerism are coming in greater number into view, as science advances. When the chemist believed himself able to find the arrangement of atoms within the molecule as truly as the order of the fingers upon his hand he seemed to have reached a limit of isomerism. Then it appeared that nature had not stopped at this limit. Whereupon the chemist bethought himself that the order of five fingers as they face on the one hand is

[1] Caffeine occurs in small amount in cacao beans, according to Schmidt (1883), theobromine being, as is well known, the principal alkaloid. The U. S. Department of Agriculture, in Division of Botany, has lately published (Bulletin No. 14, 1891) descriptions of the Ilex cassine, growing from Virginia to Texas, and used by the aborigines as a beverage on festal occasions. Prof. E. P. Venable found it to contain caffeine 0.27 per cent.; tannins, 7.39 per cent.; total nitrogen, 0.73 per cent. This plant is another species of the maté, Ilex paraguaensis (Am. Jour. Phar., 57, 389). The South African "bush tea," used for a beverage, consists of species of Cyclopodia. Three of these species were examined by Greenish in 1881 (Phar. Jour. Trans., [3] 10, 217-221) for caffeine, and none was found. Another species was examined for caffeine by Church in 1870 (Chem. News, 22, 2), and none was found. A few months ago a small sample of a leaf stated to be a species of Cyclopodia, and a "bush tea" from South Africa, strayed to my laboratory. Analyzed by Mr. Gomberg it was found to contain caffeine. A further sample has been sent for.

not the order of the five as they face on the other hand, and lo! these were just some of the additional possibilities that nature had filled out. Moreover, the most recent biological chemistry is full of suggestions of isomerism as yet not traced out at all. But caffeine is a body so well controlled in its structure, that the limits of variable order in its molecular parts are not out of the reach of chemical studies.

A difference of physiological effect, once well established for a pure body, a body that is one in all its laboratory reactions, chemical and physical, is a difference to be accepted as proof of isomerism. This might be termed physiological isomerism, but it must be a chemical fact none the less. It must be due to the manner of chemical union. Matter is made up of molecules, and a molecule is always a product of chemical action, whether such action can be traced out or not. If a function of life can serve as a qualitative reaction for any chemical body, a reaction to which chemical union is more sensitive than it is to light or heat or laboratory reagents, it belongs to the chemist to measure the results as well as he can.

But it were well first to avail ourselves of existing evidence as to the relative effects of tea as a whole and coffee as a whole. Such evidence, whether taken from certain functions of the body or from the sum of all the functions, is conclusive to many persons. If not conclusive to the pharmacologist, who would measure effects of each constituent upon each function taken separately, still the evidence drawn from the action of the whole of tea or coffee is not without bearing upon our estimate of the value of caffeine. We have a right to ask what there is in tea, and in coffee, beside alkaloids, to which the observer can ascribe the effects of these articles as beverages. Some answer to this question ought to be afforded by chemical analysis, as I have urged from time to time since 1876. The question, like others of the same sort, is not so simple as it is apt to be supposed; and much careful analytical work is wanted upon it.

What is wanted is a full analysis of the entire content of the ordinary beverage infusion of tea and of coffee. If we go to the common analyses of the books, we fail to find out what and how much, out of tea or coffee, goes into solution and into the stomach and into the blood, for dynamic registration by the brain, the heart, the vascular system, etc. Such account of the actual content of the beverage infusions as I have been able to collect, I have grouped together in the accompanying table. Some of the earlier data were obtained in my laboratory, a former student of mine has independently furnished the fullest data, other quite comprehensive results are from sources remote from my personal knowledge, and to fill up a few gaps I have resorted to factors of comparison. The citations specify the several sources of the figures presented.

The following conclusions are evident:

1. The alkaloid counted as caffeine is mostly dissolved by ordinary hot infusions and by decoctions of tea and coffee, even if brief in maceration. Of the two beverages, coffee is apt to be a little the richer in alkaloid, but this difference is not distinctive. Three grains per pint is a common proportion.

2. Tea beverage is very rich in tannins, which are nearly absent from coffee beverage. Tannins are very slowly drawn into infusion, so that the time and temperature of infusion govern its astringency. A cup of tea may have from two to six times as much of tannin as it has of alkaloid.

	Alkaloid.		Tannins.		Soluble Ash.		Potassa.		Other Soluble Substances.	
	Tea.	Coffee.	Tea.	Coffee.	Tea.	Coffee.	Tea.	Coffee.	Tea.	Coffee.
I. *Total Content*, in percentages:										
1. GEISLER, 1884: in averages of 30 grades (*Note A*)	2.6	..	15.2	..	3.5	..	..	..	21.7	..
2. DRAGENDORFF, Univ. Dorpat, 1874: 23 grades (*Note B*).	2.0	1.1	12.4	..	..	..	2.3	2.4	17.0	..
3. The writer and Mr. Clark, 1876: 15 grades (*Note C*)	..	..	12.0	..	..	..	..	..	..	..
II. *Dissolved in Infusions*, as per cent. of dry article:										
1. GEISLER, 1884: by infusion at 100°C. (*Note D*)	2.4	..	9.2	..	3.8	..	1.4	..	12.5	..
2. FELLOWS, 1880: by 10 minutes (*Note E*)	..	..	0.6	0.0	..	..	..	..	..	..
3. FELLOWS, 1880: by 20 minutes	..	..	1.5	0.1	..	..	..	..	..	..
4. FELLOWS, 1880: by 30 minutes	..	..	2.5	0.8	..	..	..	..	..	..
5. KENRICK, 1891: (*Note F*) 13 black teas	2.8	..	5.4	..	3.5	..	..	..	12.0	..
6. KENRICK, 1891: 18 Japan teas	2.5	..	9.4	..	3.6	..	..	..	14.6	..
III. *Content of Infusions, in Grains per Pint*:										
1. Calculated from Geisler (II. 1) (*Note G*)	2.5	..	4–13	..	3.8	..	1.4	..	12.5	..
2. Calculated from Kenrick (II. 5,6) (*Note G*)	2.65	..	5–9	..	3.5	..	..	..	13.3	..
3. By Fellows (*Note E*) direct	..	..	3.3	0.9	..	..	..	..	..	..
4. Calculated from I. 2 and other sources (*Note H*)	..	3.5	..	..	..	..	9.5	..	6.3	.. 56.0
5. Frequent proportions, summarized	2.5	3.5	7.0	0.7	3.5	9.5	1.4	6.3	13.0	56.0

Note A.—J. F. Geisler, chemist to the New York Mercantile Exchange, American Grocer, October 23, 1884; Prescott's Organic Analysis, 1887. The thirty grades embrace six "Indian teas," with an average of 15.8 per cent. tannins; thirteen Oolong, 16.4 per cent. tannins; and eleven Congou, 12.6 per cent. tannins. The teas were obtained of importers, as selected representative grades. Percentages are given on the tea dried at 100° C.

Note B.—"Werthbestimmung," p. 60. Recalculated to give percentages on the tea dried at 100° C. From twenty-three grades and varieties of tea; the tannins from only four varieties. From twenty-five varieties of coffee; the potassa from only seven of these. The analyses of teas are credited to Prof. Dragendorff and Mr. Weyrich.

Note C.—Univ. Mich., 1876; Am. Chemist, 7, 44. In use of a method of volumetric analysis with cinchonine, titrating the excess with iodomercurate, as adapted for analysis of tea in the work reported upon.

Note D.—The contribution cited in *Note A*. Average of results from sixteen varieties. These results are separately given in the report, as are those of I, 1. The infusions were made by 100 parts of distilled water, poured on boiling, and standing ten minutes. The percentages are given on the air-dry tea. (The thirty teas of I, 1 average 6.6 per cent. of moisture.)

Note E.—Chem. Lab. Univ. Mich., 1880; Physician and Surgeon, 2, 342. From eleven varieties of tea and six of coffee. Infusions in 50 parts of distilled water at about 90° C.; the estimations by the same method designated in *Note C*. In some way, perhaps in not accounting for retained liquid (out of the 50 parts of solvent) the results are probably too low, but they are of value in comparison with each other, showing the effect of prolonging the period of infusion, and the difference between coffee and tea in parallel conditions.

Note F.—Laboratory of Internal Revenue Department, Ottawa, Canada, 1891, Bulletins No. 24 (tea) and 29 (coffee). The infusions were made under the conditions adopted by Geisler, *Note D*, namely: ten minutes action of 100 parts of water, taken boiling. The percentages are given upon air-dry tea; the moisture being 6.5 per cent. for the black, and 4.0 per cent. for the Japan varieties.

Note G.—In these calculations a certain "strength" of each beverage must be assumed. The standard of common strength which the writer arrived at, from various data, in 1880, is here adopted. The data are given by the present writer, in Physician and Surgeon, 2, 342, and the standards are as follows: For tea, 73 parts of water, 1 pint from 100 grs.; for coffee, 23 parts of water, 1 pint from 317 grs. This gives 224 five-ounce cups from one pound of tea, and forty-five eight-ounce cups from one pound of coffee. To this strength the results of Geisler and of Kenrick are reduced. Of course Geisler's infusions, more dilute, would dissolve somewhat more than an infusion of this domestic average. The greater concentration of coffee beverage should bring down these figures, and infusion for over ten minutes would raise them.

Note H.—Calculated to the assumed average strength of beverage stated in *Note G*.

3. Coffee beverage carries quite constant potassium salts amounting to four times the quantity in tea beverage. A cup of coffee contains potassium salts about twice the quantity of its alkaloid. Some of the potassium is in phosphate.

4. The nutrient and other remaining solids in coffee infusions amount to four times the quantity of the corresponding solids in the infusions of tea. A pint of coffee contains an average of 50 to 60 grains of solids beside alkaloid, ash, and tannin. The

pharmacology of some of these bodies ought to be studied.

5. There follows to be determined the homologues of caffeine (theophylline, theobromine, and xanthine), their presence, quantity, and effect. Then remains, if found at all, any evidence as to isomeric caffeines. For these inquiries it is needful to discuss the known constitution of caffeine itself.

Caffeine stands apart from vegetable alkaloids as a class. It is not a derivative of pyridine. It does not give evidence of a closed chain of carbon atoms in the same state of saturation found in pyridine derivatives. It does not contain any part of the fruitful benzene molecule. When it is broken up in any way, aromatic compounds are not formed out of it. In all these related particulars caffeine is unlike the numerous alkaloids of cinchona, or opium. or hydrastis, or coca, or pepper, or conium, or henbane, or tobacco. It stands apart, also, in the great content of nitrogen it carries, namely 28.8 per cent. Proteids have 16 per cent.; quinine has 8.6 per cent.; strychnine, 9.0 per cent. of the same element.

Caffeine is a thrice methylated xanthine as clearly as chloroform is a thrice chlorinated methane. As trimethyl-xanthine its chemical possibilities in general are those of xanthine, itself. As a tri-derivative of xanthine, it is methyl-saturated, and does not have the obvious theoretical possibilities of isomerism that di-derivatives and mono-derivatives possess. These have been readily realized in synthesis.

Of the four atoms of hydrogen in xanthine, $C_5H_4N_4O_2$, only three are linked to nitrogen, and only these three are replaceable by methyl. The fourth atom of nitrogen in xanthine is linked to carbon only, in the manner of a tertiary base. Probably this is the point of unyielding difference between uric acid structure and xanthine structure, preventing the conversion of the one ($C_5H_4N_4O_3$) into the other ($C_5H_4N_4O_2$). The resistance to such conversion was shown by E. Fischer in 1884.[2]

Four methyl groups can be introduced into uric acid; only three into xanthine.[3] In every case the introduction is a substitution for hydrogen, and a linking to nitrogen. In every case, when the methylated compound is broken up, the methyl groups remain linked to the nitrogen, either in methylated urea or in methylated ammonia.

Xanthine and uric acid agree in this, that they contain two molecules of urea united to an unsaturated chain of three carbon atoms. The carbon chain holds the fourth hydrogen atom of xanthine, and the third oxygen atom of uric acid. Each urea group contains two ammonia groups. When an ammonia group is broken off, it is capable of neutralizing one valence of an acid, forming a strong salt. Were the four nitrogen groups of xanthine, or caffeine, sufficiently positive in their polarity, then they would hold four valencies of an acid. Then caffeine would be a quadrivalent base. But it lacks the positive polarity to be a decided base at all. Urea is almost as near an acid as a base, such is the negative power of its carbonyl group. The three-carbon chain of xanthine, and of uric acid, introduces such a negative preponderance that they are acidulous rather than basal. The mono-methyl, and di-methyl derivatives of xanthine are less basal than caffeine. When three methyl groups are introduced their polarity as positive groups appears to create a slight balance of electro-positive quality to the molecule. As a result caffeine is capable of serving as a base, but not to the extent of more than one valence. So urea can at most hardly neutralize more than one acid valence. When an acid valence is united either to caffeine or to urea, its negative polarity so far preponderates in the entire molecule that the remaining nitrogen groups are powerless to unite with acids. The case is like that of acetamide. That caffeine unites with strong acids, slowly but in final proportions quite true for monovalent base, was demonstrated last year in the admirable paper of Mr. H. W. Snow.[4] The acetate, however, was found by Biedermann[5] to be divalent.

In the halogen derivatives, however, such as bromo-caffeine, chloro-caffeine, etc., the halogens are received as they are by a hydrocarbon. One halogen atom can be united by substitution for the fourth atom of hydrogen. Also two halogen atoms can be united by a saturation of the unsaturated couple in the carbon chain. Union of hydroxyl, the amido group, an ethoxy group, etc., in this way, are unions independent of the nitrogen groups, or of any basal properties whatever.

The introduction of a methyl group in connection with the carbon chain of caffeine has not been accomplished. To do this would be to make an interesting homologue of caffeine. To make the same introduction in theobromine would give us a clearly distinct chemical isomer of caffeine. An attempt to make this isomer by different well-known methods for such substitution, has been faithfully made in my laboratory, this season, by Mr. M. Gomberg, as a part of investigations, not yet published, upon the question of isomerism of caffeine.* Various conditions of reaction were employed. This much is evident, the carbon chain does not readily attach either methyl or ethyl. On the other hand, the impossibility of such methyl introduction has not been established. Mr. Gomberg has introduced other groups, not heretofore brought into union with the carbon chain, and will proceed upon the line of work in which he is engaged.

As to the possibility of a plural of trimethyl-xanthine, some things are obvious. Assuredly its isomerism, in the more common ways, is not pointed out to us by the chemistry of the xanthine group. The fourth atom of nitrogen in this body does not receive methyl, except by bivalent addition, a sort of over-saturation. No asymmetric carbon atom appears in the body. And whether from coffee or from tea, the alkaloid is inactive to polarized light.[6] But it would be rash to assert the impossibility of isomerism of any sort. For example it is open to ask whether the atom of hydrogen not methyl cannot link to the intermediate carbon of the mesoxalic chain, doing

2 Ber. d. chem. Ges. 17. 328. The report of Strecker from the work of Rheineck, in 1864. (Ann. Chem. Phar. 131, 121) that uric acid is deoxidized to xanthine by sodium amalgam, was a singular instance of error lingering long in literature. It was disproved by E. Fischer in 1884 (Ber. d. chem. Ges. 17, 1776.)

3 This is true of the substitution compounds. The addition of methyl iodide to caffeine, obtained by Tilden (1865: Jour. prakt. Chem., 94, 374) and examined by Schmitt (1883: Ann. Chem. Phar. 217, 270) (1885: ibid 141) furnishes an apparent approach to a xanthine derivative. This addition compound is, however, a sort of supersaturated body.

4 1891: Proc. Am. Phar. Assoc., 39; Further, Lloyd, 1881: New Rem., 10, 38.

5 1883: Archiv. Phar. [3] 21, 175; Jour. Chem., Soc., 46, 185.

* Read in Am. Assoc. Advancement of Science in August, 1892, "Trimethyl Xanthine and some of its Derivatives," by Moses Gomberg, M.S.: Am. Chem. Jour., 14, 611. (Reprints.) Mr. Gomberg continues this investigation, working in the laboratory of the writer.

6 This was determined in the writer's laboratory in 1887. Other physical differences were sought for and not found. (Unpublished records.)

this in exchange with the valence of nitrogen of the third position.

With some outline of caffeine structure before us, it will be easier to see its relation to certain of its homologues, some of which, as already intimated, have been found in tea. There is a lack of thoroughgoing analysis to this end. The reports, so far as I have found them, are as follows:

Theobromine, or dimethyl xanthine, the alkaloid of chocolate, was found in Himalaya tea by Zöller in 1871.[7] Its solubilities in water and in ether are not so large as those of caffeine, but in smaller quantities it will not be excluded in customary preparations of caffeine. Neither will it be detected by ordinary tests. Xanthine itself, and hypoxanthine, were found in several samples of tea by Baginski, in 1885.[8] It has not been much searched for. Its very slight solubility in water would, apparently, reduce its proportion in infusions to very narrow limits, even if present in tea leaf, but as it is exceedingly soluble in alkalies it may be affected in solubility by the presence of the alkali salts of tea.

A dimethyl xanthine, isomeric with theobromine, was announced as a discovery in Himalaya tea, by Kossel, in 1888,[9] who named this new vegetable body, theophylline. Like theobromine it unites with alkalies as well as with acids. Its methyl derivative was found identical with caffeine. Broken up, its alloxan is a dimethyl compound, its urea is not methylized; so its methyl groups are in positions 1 and 2. This explains its difference from theobromine, in which a methyl group occupies position 3.[10] Theophylline was found much more soluble in water than theobromine. Therefore, if in tea leaf, it will be in the infusions. As described, its presence in caffeine would probably be overlooked.

The existence and occurrence of theophylline has not been verified or followed up. Kossel had been known in chemical literature for his frequent contributions analytic and synthetic upon xanthine and allied bodies, for eight or nine years prior to the announcement in question. The year after, Messrs, Paul and Cownley[11] examined the extract of 200 grams of tea of Himalaya, and found an alkaloid not fully determined. They have since[12] reported a series of estimations of "theine" in tea, without, so far as I have seen, any account of residual alkaloids. Coffee does not appear to have been carefully examined for alkaloids homologous to caffeine, that is, trimethyl xanthine, and the same is true of guarana, maté and kola.

It has been usually assumed that pure "theine" is the alkaloid of tea completely freed from matters not alkaloids. "Caffeine" and guaranin" have been defined in the same way. There is now a degree of uncertainty as to the chemical purity of the several articles under these names, an uncertainty which it belongs to the chemist to clear up. Let us see what stipulations of purity have been made for these articles when they have been taken for physiological trial.

Shortly after Emil Fischer's researches on the xanthine group, showing how little relation xanthine has to uric acid, and how clear is the homology of caffeine and theobromine to xanthine, Wilhelm Filehne made a pharmacological investigation of these four bodies. This was in 1886.[13] Happily, Fischer supplied Filehne with the articles, xanthine, caffeine, theobromine. No mention is published of any precautions against xanthine as an impurity in caffeine, nor any statement as to the source of the caffeine, whether from tea or coffee or synthetic work. The object was a physiological comparison of xanthine, dimethyl-xanthine, and trimethyl-xanthine. Filehne found the three bodies to differ in degree rather than in kind of action, and that the effect of xanthine was the most intense, that of trimethyl-xanthine the least intense of the three. He found, as others have, that uric acid does not possess the power of xanthine at all. Ethoxy-caffeine was found by Filehne, as also by Baumetz,[14] to have a distinctly different, somewhat stronger action.

Dr. Thomas J. Mays, in 1886,[15] made a full and careful comparative trial of caffeine and theine. He had the alkaloids prepared for him by designated makers, to ensure that the one came wholly from coffee and the other from tea, but no mention is made of other precautions as to purity. In his conclusions the two are not identical.

In 1887 Dr. T. Lauder Brunton put caffeine and theine upon pharmacological trial.[16] His precautions as to true samples are mentioned as follows: He obtained the caffeine from Schuchardt. The theine was a pure specimen from Messrs. Hopkins and Williams. In referring to the "discrepancies" between Dr. Mays results and his own, Dr. Brunton says they may be "due to difference in the animals employed or to variations in the theine," "*for it is just possible that there can be differences in the active principles obtained from different kinds of tea, or even from the same kind by different methods of treatment.*" Dr. Brunton did not find his "theine" and his "caffeine" to have the same action, nor did he find the difference between the two to be the same recorded by Dr. Mays.

In the present state of evidence, then, we reach certain conclusions as follows:

1. The five beverage plants owe some of the differences in their effects to their different yields of bodies not classed as active principles.

2. The total active principle of a beverage plant, the "theine,', "caffeine," etc., as obtained, is perhaps liable to contain small quantites of xanthine and other homologous bodies of physiological effect.

3. The main active principle in each of the five beverage plants is, unquestionably, a trimethyl-xanthine. Chemical studies indicate, as yet, only one trimethyl derivative of xanthine. If, however, strictly pure trimethyl-xanthine, known as caffeine, from one plant clearly differs in physiological effect from the same body taken in strict purity from another plant, then the chemist will recognize a proof of isomerism, and await its explanation by later chemical researches.

University of Michigan.

Discussion.

Prof. Remington called attention to the scientific foundation for the custom of simply making an infusion of tea, by

[7] This body may have been theophylline.
[8] Zeitsch. physiol. Chem., 8, 395; Jour. Chem. Soc., 48, 286.
[9] A. Kossel, 1888; Ber. d. chem. Ges., 21, 2164; Jour. Chem. Soc., 54, 114; Am. Jour. Phar., 60, 461.
[10] From theobromine, a monomethyl alloxan is obtained with a monomethyl urea.
[11] 1889: Phar. Jour. Trans. [3] 19, 24; Jour. Chem. Soc., 56, 416.
[12] 1891: Phar. Jour. Trans. [3] 21, 61; Jour. Chem. Soc., 60, 358.
[13] W. Filehne, 1886: Achiv. Anat. Physiol., p. 72; Therap. Gazette, 10, 628.
[14] 1886: Therap. Gazette, 10, 765.
[15] Therapeutic Gazette, 10, 586; Proc. Am. Phar. Assoc., 35, 335.
[16] T. L. Brunton and J. T. Cash, 1887: Proc. Royal Soc., 42, 238; Jour. Chem. Soc., 52, 985; Jour. Physiology, 9, 112.

which the flavoring substances and caffeine are extracted, leaving the insoluble tannin behind.

The chairman stated that if the statement is to be accepted that theine is different from caffeine, it will be necessary to write "theæ" after caffeine, since much of the supply of caffeine is obtained from damaged tea. Dr. Edward R. Squibb, in a letter some years ago, declared that there was no difference between theine and commercial caffeine, and threw some doubt upon the existence of caffeine, as such in the living plant. A practical point, showing that tea is prized for something more than its alkaloidal content, lies in the fact that some cheaper grades of tea are richer in caffeine than the higher-priced teas. As regards the difference alleged to exist between the alkaloid derived from tea and that from coffee, it is possible that some of the volatile substances of the tea are not fully separated from the caffeine, and modify its physiologic action; just as piperine may owe much of its stimulating qualities to volatile substances usually associated with it.

In practical medicine, the insolubility of tannin should be remembered, and in making infusions for the astringent effects, as in antimonial poisoning, or for their action on mucous membranes, the tea or coffee should be boiled. On the other hand, when the stimulating effects alone are desired, a rapid infusion is all that is needed.

In closing the discussion, Dr. Prescott said that, During the discussion which followed the reading of this paper, the question had been asked, what extent of the effect of tea and of coffee is due to their essential oils; also to what extent caffeine or theine is changed by methods of extraction. To this he replied that, undoubtedly the essential oils in question are of decided influence. Many volatile oils are of active physiological effect. However, these oils have not been separated and examined. That of coffee is developed by roasting; that of tea, not improbably, is developed by the curing process, with its stage of fermentation, and of firing. As to the alteration due to modes of extraction, he believed they could hardly extend much beyond the liberation of the alkaloid from certain combinations of the same.

COLLABORATION IN MATERIA MEDICA AND PHARMACY.

Read in the Section of Materia Medica and Pharmacy, at the Forty third Annual Meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY CHARLES RICE, PH.D.,
OF NEW YORK.

The new movement of establishing closer and official relations between the two professions of medicine and pharmacy was inaugurated at a time when its desirability, or rather necessity, had become generally recognized. Both professions have many interests in common, and both have to supplement each other by their special knowledge and attainments. Many are the topics—ethical, legal, historical, hygienic, statistical, educational, social, and particularly scientific—which can and will be profitably discussed at joint meetings of representatives of the two professions; and some of these topics may even be said to form burning questions which have hitherto been treated by the medical and pharmaceutical press mostly in an *ex parte* manner. It is hoped that these may, hereafter, be brought to a solution satisfactory to all.

But the discussion of professional topics, or the reading of papers thereon, at the joint annual meetings, does not seem to be sufficient to infuse life into a copartnership such as it is proposed to establish and maintain between the two professions. Something else, of a more lasting and permanent interest, something of tangible utility, so to say, seems to be wanted to serve as a firmer bond. In the judgment of the writer, such a bond can be established—and indeed its want has long been felt—by the official interchange of, and decision on professional or scientific problems between the two professions. The physician as well as the pharmacist, each possesses, if properly trained, a fund of special knowledge, often laboriously acquired and constantly augmented by daily practice and experience, which, in these days of rapid progress, can no longer be expected to be met with combined in one and the same person, but which has to be gathered and studied by specialists for the benefit of the other members of their own or a kindred profession. Yet it is an indisputable fact that many important facts which have long been known to or recognized by *one* profession, and which yet vitally concern the *other*, remain often entirely unknown, or only imperfectly known to the latter for a long time. If there were an official channel through which such useful information could be conveyed, at regular intervals, from one profession to the other, much would thereby be gained. It may be well to mention an example by way of illustration. Many physicians are in the habit of prescribing *aconitine* without specifying what kind they intend. They are not aware that there are *four* or *five* different kinds in the market, each of them in vogue or preferred in some particular country or locality—one being the pure, crystallized alkaloid of great power; another an amorphous substance of comparatively feeble strength; another one made by a different process, or perhaps from a different kind of aconite, being of an intermediate strength, etc.—and that they are liable to have the most powerful dispensed when they perhaps intended the weakest, or *vice versa*. Would it not be useful to present to the medical profession, once a year at least, a concise summary of important matters of this kind, which would suggest themselves from time to time? As a rule, physicians do not read pharmaceutical journals, or circulars issued by chemical houses, hence information regarding subjects like that above mentioned often reaches them only when some serious accident has happened. If there were a source of information on topics of this kind, prepared by pharmacists specially for the benefit of physicians, much good would result. On the other hand, physicians often observe objectionable features connected with the form or efficacy of pharmaceutical or galenical preparations—as for instance deficiency of therapeutic action due to improper vehicles, improper coating, etc. The same medium of communication could be used for drawing the attention of the pharmacists to these matters.

If it is conceded that such a mutual exchange of information or of problems is desirable, it will not be difficult to devise a plan by which it may be carried out. The writer suggests the following, at least as a basis upon which something better may perhaps be erected:

1. The American Medical Association, through its proper Section (or in any other way that may be determined on), may annually appoint *seven* (or any other number) members, who, together with a like number of pharmacists, who may be appointed by the American Pharmaceutical Association, shall constitute the "Committee on Therapeutics and Pharmacy" (or whatever other name may be given to this).

2. This committee shall elect a chairman and vice-chairman, only one of whom shall be chosen from the same profession. These two officers shall also be the chairmen of their respective sections (medical and pharmaceutical) in the committee.

3. The committee may either hold joint sessions at such times as may be agreed upon, or it may transact its business by correspondence.

4. Either section of the committee shall be authorized and instructed to consider any professional questions or problems which may be submitted to it by the other, and after deliberation, to give such an opinion or such a decision as the subject may warrant, from the standpoint of the profession rendering the opinion or decision.

5. The section of the committee making the request or appeal shall bring the reply or decision of the other to the knowledge of the whole of its own profession, or, when this is unnecessary or inadvisable, at least to the notice of those to whom it more particularly applies.

6. The committee, or, if so determined by it, either or both of its sections separately, shall annually report at the joint meeting of the two professions (or say to the Section on Materia Medica and Pharmacy of the American Medical Association?) the nature of the questions and problems mutually submitted, if any, and the respective opinions or decisions rendered. These decisions shall be subject to a revision, if one is called for, at this meeting.

7. Each section of the committee shall annually present a report upon professional topics which it may be thought particularly necessary to bring to the attention of the other profession. Thus, the section on pharmacy may present, for instance, a report on new remedies, accompanied by practical suggestions as to their best mode of administration, as to precautions to be observed in prescribing them, as to incompatibilities to be avoided, and similar topics. And it may submit questions or problems involving *therapeutics as it affects pharmacy* to the other section, with a view of having them answered or decided. The section on therapeutics may, in its turn, present problems or questions involving *pharmacy as it affects therapeutics* to the other section for solution or answer.

In presenting this plan, the writer had in view scientific professional topics rather than ethical ones. There is no doubt that the latter would also form an abundant source of discussion and that this would, if properly conducted, bring the two professions still closer together; but it will under most circumstances be preferable to relegate such topics to the general annual meeting, there to be fully discussed and decided, rather than to have them passed upon by a small committee, the action of which may after all not be finally endorsed by the Association. On the other hand, a reversal of any decision by the committee on *scientific* topics, rendered after proper study and discussion, is scarcely to be apprehended.

The practical benefit which may be expected to be derived from an active coöperation of the two professions in the manner above outlined, provided the plan is fairly tried in practice, are believed to be such that the annual reports of the joint committee would be looked forward to with eagerness and interest.

New York, May 20, 1892.

Mr. John L. Woods, of Cleveland, Ohio, made a Christmas gift of $125,000 to the Medical Department of the Western Reserve University.

SECTION ON MATERIA MEDICA AND PHARMACY.

The sessions were held in the building of the Detroit Young Men's Christian Association, on the afternoons of June 7, 8 and 9. Dr. Frank Woodbury, of Philadelphia, Chairman of the Section, occupied the chair. On account of the absence of Dr. Whelpley, of St. Louis, Dr. F. E. Stewart, of Wilmington, Del., kindly accepted the position of Secretary *pro tem.* A delegation from the American Pharmaceutical Association was present and contributed largely to the proceedings. Among those present were Joseph Remington, Professor of Pharmacy in Philadelphia College of Pharmacy; Dr. A. B. Prescott, of the University of Michigan; Dr. H. A. Hare, of Jefferson Medical College; Professor P. W. Bedford, New York; E. H. Squibb, M.D., Brooklyn, N. Y.; H. W. Snow, Omaha, Neb.; Lewis C. Hopp, Cleveland, O.; J. E. Clarke, M.D.; H. W. Snow; A. S. Parker; J. W. Rabe; F. W. Jackson; F. A. Thompson; Prof. Eli H. Long, Detroit Medical College, and others.

The Chairman, in opening the deliberations of the session, directed attention to the evident disposition of the Association to devote more time to scientific work, and thus greatly increase the usefulness of the Sections. A peculiar feature of the Section on Materia Medica and Pharmacy, is that the Association has formally invited the American Pharmaceutical Association to be represented by delegates who shall participate in its scientific work. This recognition of the high standing of representative pharmacists is a just tribute to their professional attainments, and establishes pharmacy as a department of medical science. This is a consummation of immense value to both medicine and pharmacy; and that we have been able in any way to assist in bringing it about, should be a subject of congratulation. Its consequences upon the development of pharmacy in this country must be great and far-reaching. Biological chemistry and practical pharmacy are closely related and should be studied together. The present aspect of medicine, speaking from the therapeutic standpoint, is largely chemical, and is mainly based upon chemical ideas. Nutrition is largely a chemical problem. Indeed, we might almost represent health by a very complex chemical formula, graphically written, so as to express exact molecular composition. Various modifications and substitutions may take place, representing departures from the normal, more or less marked and corresponding with certain diseases or diatheses. While the researches of bacteriologists have revealed specific microorganisms characteristic of different infectious diseases, later observations serve to establish the fact that these so-called disease germs do not so much cause disease directly by their numbers as they do so indirectly by their chemical products, which enter the blood and act as toxic agents. The important relation of pharmacy to medical practice is, that it supplies chemical substances capable of acting as antidotes to the poisonous action of these agents. As illustrations we have quinine and arsenic against malaria; Koch's tuberculin against phthisis; acids against cholera, etc. It may be regarded as demonstrated that phagocytosis is influenced materially by chemical substances.

The first paper was one by Dr. Albert B. Prescott, of the University of Michigan, entitled "Caffeine and the Question of Its Isomerism."

In the absence of Dr. E. L. Patch, of Boston, his paper on "Examination of Market Fluid Extracts" was read by title.

A paper on "Pharmacy at Health Resorts," by Dr. F. E. Stewart, was also read by title.

Prof. Joseph Remington, of Philadelphia, read a paper entitled "Prescription Exigencies."

Second Day—June 8.

The discussion on the Revision of the United States Pharmacopœia was opened by Prof. Joseph Remington, of Philadelphia, a member of the Committee on Revision. He stated that the Pharmacopœia is rapidly approaching completion and that much of it is already in type. It is believed that the work will appear before the end of this year. Some important changes have been made, the most notable being the adoption of the metric system in the formulæ. The hope was expressed that this change would be approved and supported by the members of this Section.

The following resolution offered by Dr. Prescott was unanimously adopted:

Resolved, That we desire to urge upon the medical profession the desirability of the direct use of the Pharmacopœia of the United States by the physician himself, as a handbook of reference in materia medica.

That we urge upon teachers of materia medica such a direct use of the Pharmacopœia, by classes of students of medicine, as will ensure their habitual familiarity with the work itself.

Dr. Prescott said he desired to testify to the large labor undertaken and carried out by the Committee of Revision. As a member of the revision committee of 1880, he has full realization of the work involved. The committee of that revision expended the residue of the receipts from copyright in publishing a digest of published criticisms upon their work. A great deal of time has been expended by this committee in consulting these published criticisms. Also a great deal of experimental labor has been devoted to their work, as he said he knew from a reading of portions of the circular correspondence of the committee which had been kindly placed in his hands.

The Chairman opened the discussion on "An International Pharmacopœia." He stated that the adoption of an International Pharmacopœia has been under consideration for a number of years. The present seems a particularly propitious time for renewing the agitation. Americans read English and Continental medical journals and books, and extracts from these, containing formulæ, are constantly reappearing in American journals and text-books. As there are marked differences in strength among many products bearing the same name (such as tincture of belladonna), and as even the ounce of water is not the same in the British and United States Pharmacopœias, an International comparative commentary upon the different pharmacopœias, containing the principal drugs in use by civilized nations, with their preparation, seems necessary. Such a work would be most convenient for reference, both for physician and pharmacist.

On the matter of an International Pharmacopœia Dr. Prescott said that he believed there was a proper field for this work, as a brief work, for the coördination of the several National Pharmacopœias, with definition of only the most important and frequently used articles. He hoped it would not be misapprehended, as a work designed at all to supersede the pharmacopœias of the several countries.

A series of resolutions was offered thanking the Committee on Revision for their valuable labors upon the Pharmacopœia, and requesting that in all doubtful questions coming up for decision preference would be given to those that would facilitate the creation of an International Pharmacopœia. The resolutions were unanimously adopted.

THIRD DAY—JUNE 9.

A communication by Dr. Charles Rice, of New York, on "Collaboration in Materia Medica and Pharmacy," was read and discussed.

The suggestions contained in Dr. Rice's paper were referred to a committee of conference to report at the next annual meeting.

The following papers were read by title: "Europhen," by Dr. J. V. Shoemaker, of Philadelphia; "Tablet Triturates and Dosimetric Granules," by Dr. Wm. F. Waugh, of Philadelphia; and "Notes on Therapeutic Novelties," by Dr. I. N. Love, of St. Louis.

The Business Committee of the Section was elected as follows: Dr. Horatio C. Wood, of Philadelphia; Dr. F. E. Stewart, of Wilmington, Del.; and the Chairman of the Section.

The election for officers resulted in the reëlection of Dr. Frank Woodbury as Chairman, and the election of Dr. F. E. Stewart as Secretary.

PRESCRIPTION EXIGENCIES.

Read before Section on Materia Medica and Pharmacy, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY PROF. JOSEPH P. REMINGTON, Ph.M.,
OF PHILADELPHIA, PA.

"Every pilot
Can steer the ship in calms; but he performs
The skillful part, can manage it in storms."
—*Sir J. Denham.*

The prescription is justly regarded by both professions as the most important link in the chain which binds them together. Upon the insignificant scraps of paper are traced the characters which represent the conclusions reached by the practitioner after most serious consideration of the patient's case and to the earnest physician the writing of the prescription is his most responsible duty. Notwithstanding the exceptions to the rule that are constantly forced to the attention of the pharmacist, safe ground can only be held by assuming that the physician always means what he writes and writes for exactly what he means. But, exigencies arise, we are all fallible, and "errare est humanum" must never be forgotten. Constant vigilance must then be the rule for the apothecary. Yet it must be admitted by all that when the vast number of prescriptions that are written every day are considered, that very few serious errors occur it must also be noted that with the great development of modern pharmaceutical methods, systematic habits and checks are now used, which reduce the danger arising from ignorance, carelessness or lapses, to a minimum.

It has occurred to the writer that it might prove of some service to call attention to a few of the more common exigencies, many of which require skill, tact and judgement to successfully master. At the present time, every careful pharmacist uses what is known as the checking system. By this is meant the calling off by the compounder to a second person the various ingredients with the weights or measures used of the prescription. Before this method came into general use, many instances are on record of mistakes occurring from the use of the wrong ingredient, from the omission of something, or from an error in writing the label.

In one recorded instance, a prescription was compounded by the proprietor in which one of the principal ingredients was omitted. The bottle containing the medicine was handed to the boy of the family who started to take it home. When the pharmacist returned to his desk, he realized that the principal ingredient had been left out. He quickly explained the situation to a bright-witted boy, who managed to reach the messenger carrying the bottle before the latter had arrived at his destination. It was but the work of a moment for the embryo pharmacist to stumble and fall in such a manner against the bottle that it fell to the ground. Of course the usual pleasantries (?) were exchanged but it ended in the apothecary's boy reluctantly promising to have the prescription compounded without expense and delivered at once.

Nearly every pharmacist can recall instances of a persistence in adhering to an erroneous name or quantity by a physician in writing a prescription. Notwithstanding the fact that the compounder is positively certain that the physician does not want what he has written for and the true state of the case has been set before him, so firmly has the error become wedged in his inner consciousness, that he indignantly persists in having the prescription compounded exactly as he has written it.

An amusing instance of this occurred in the writer's personal experience. One of the most celebrated practitioners in Philadelphia wrote a prescription which was sent to be compounded. It was as follows:

℞. Troch. chloroformi No. xii.
(Gr. v.)
Sig. Take one every two hours until relieved.

Suspecting that this was an instance of persistent adherence to a wrong impression, a messenger was sent with a note to the prescriber calling attention to the fact that there must be some error, as there would be no certainty that the patient would get any

chloroform, owing to its volatility, even in the first lozenge. The messenger was told very promptly (and evidences of wrath accompanied the communication), that Mr. —— better compound his prescriptions just as they were written and that he was too busy to be bothered by such trivial interruptions. The assistant quickly returned with the tart reply and Mr.——, dutifully (and let us hope humbly) proceeded to prepare the chloroform lozenges, when suddenly the front door was thrown open and a flashing vision crossed the threshold; the next moment, a beaming face, adorned by the traditional gold spectacles of the wearer, was thrust around the prescription counter. "I beg your pardon, Mr. ——, but I did not want chloroform but chloral lozenges." It is hardly necessary to say that the incident closed without prejudice to the patient.

Faulty abbreviations are constant sources of perplexity to the pharmacist. It would be far beyond the scope of this paper to enumerate even the more important of this class and it is only the cautious, intelligent pharmacist who has not only the knowledge, but more than this the intuition with which to select the substance intended by the physician and send it on its mission of healing. In this connection, I trust that I may be pardoned for alluding to an annoyance which has become widespread in this country. It is the writing in the place of the time-honored "Signa," the words, "As directed," often abbreviated "As dir." It has been urged in extenuation and in justification of this habit that the patient was intelligent and had no difficulty in understanding the verbal directions and that they were too long to write upon a label, etc., etc.; my brethren in the pharmaceutical profession will bear me out in saying that very often the patient will say when the finished prescription is handed to him, "How am I to take this?" "Well the doctor has given you the directions, has he not?" Yes he did but I have forgotten them." "Had you not better ask him?" "Oh, no, that will never do. That means two dollars more." So rather than pay the physician another visit, the patient takes his chance and probably makes a mistake. When a faulty abbreviation occurs with an "As directed" for a "Signa," the combination becomes very puzzling.

℞. Hyd. chlor. grs. x.
Sig. As dir.

A natural delicacy which can be well understood prevents the apothecary from asking any questions of the patient regarding the prescription, for fear of throwing an element of doubt or suspicion around it. Thus we have presented another "Prescription Exigency." Most pharmacists would probably ask the patient how he was told to use the medicine and thus a clue would be offered which might or might not lead to satisfactory results. Unless the answer was unmistakable, it would be unsafe to proceed. Then the statement could be made that this prescription would have to be sent by messenger as it would take "considerable time to compound it." It is needless to say that no statement need be volunteered that the greatest share of this time will be spent in hunting the physician who wrote it.

The development which is ever going on in matters pharmaceutical has educated the public to expect bright transparent liquids for their medicines; and, when such are not dispensed, critical remarks are sometimes forthcoming. The thoroughly educated members of both professions know very well that the transparency of a liquid sometimes means that the greater part of the active principle of the prescription has been left upon the filter; and, the question which is presented to the pharmacist nearly every day of his professional life is, "Should or should not this prescription be filtered before dispensing?"

The behavior of solvents towards certain chemical substances, the extent, character and condition of the precipitate formed, the effects of temperature, are all factors which must be carefully weighed in the balance; and, it will be easily seen that a large fund of knowledge is required not only of the reactions of the official substances, but also of the physical and chemical properties of the immense number of the new synthetical products, which are crowding the shelves of the apothecaries and filling the coffers of the jubilant foreign manufacturers.

A frequent cause of friction arises between physician and pharmacist because of a difference of opinion or practice among pharmacists in the matter of filtration. A physician writes a prescription which is slightly incompatible; a precipitate (trifling possibly) ensues. The pharmacist, Mr. A., who compounds it concludes that it is unimportant, filters it out and dispenses the prescription in a transparent condition. The doctor sees the prescription at the patient's house, notices it, is pleased with the results and prescribes it in another case. This time the prescription goes to a different apothecary, Mr. B., who thinks that the precipitate may contain some activity and therefore it better not be filtered. The physician sees this prescription at the house of the patient and may say to him, "Why don't you get your prescriptions of Mr. A.? This muddy mixture is not right." The patient of course does not wish to pay for a prescription which has been improperly compounded, enters complaint, and there is very apt to be some hard feeling. The apothecary retaliating probably by showing the patient that the fault lies with the doctor who wrote the prescription, because he did not know that precipitation would take place. Due consideration and a proper spirit of professional etiquette should inspire the members of both professions and under no circumstances should the patient be a witness to differences of opinion.

The question of the use of cautionary or poison labels upon prescriptions has been fortunately settled legally in a satisfactory way and knowledge of this should be spread as far as possible. An apothecary of excellent reputation on one of the principal streets of Philadelphia, a few years ago, received a prescription from a well-known physician which ordered tincture of nux vomica to be taken in five drop doses. It happened to be compounded by a very conscientious and as it proved an over careful assistant, who reflecting that the bottle might be placed within the reach of children (and thus become dangerous) pasted upon the bottle a poison label. It happened that this particular prescription was for an old and hypochondriacal lady, who took fright immediately on seeing the poison label, sent for the doctor and peremptorily discharged him for daring to prescribe poison for her. He naturally sought the apothecary and what took place at the interview can well be imagined. The order went forth, however, from the apothecary that thereafter no prescription should be labelled "poison" except when so ordered by the physician.

Very remarkably not long after this occurrence, a family having vacated rooms in a tenement house were succeeded by a new tenant. As is customary in such cases, some of the friends of the incoming family aided in the moving. One of the inquisitive helpers found a bottle of sugar-coated granules, in one of the closets; and having seen some candies which resembled the granules, distributed them among the rest of his friends and they were eaten with apparent satisfaction. Violent convulsions ensued, medical assistance was summoned but one of the helpers lost her life. Investigation showed that the bottle contained granules of strychnine; that the label showed that they came from the same drug-store in which the conscientious assistant was employed and that this time the rule—not to put a poison label on a bottle unless ordered by the physician—had resulted in a death and the apothecary appeared to be empaled on both horns of the dilemma. The next friend of the unfortunate girl entered suit against the apothecary for negligence in not labelling the bottle "poison." But the case was thrown out of court without much difficulty, the ruling being that no blame could be attached to the apothecary as he had strictly followed the directions of the physician. The case excited a great deal of interest; many physicians going on record, that it was a vital necessity in many cases that the character of the medicine should not be known by the patient. This rule can then be formulated—poison labels are not to be placed on prescriptions unless ordered by the physician.

In connection with the subject of labels, it may often occur to the mind of the physician that he sees now frequently what are known as "Shake well" labels on liquids, that appear to be perfectly transparent. This is probably due to the fact that several dangerous poisonous cases have occurred through the precipitation of scanty, colorless precipites. The mixture of bromide of potassium with sulphate of strychnine was one of these. Insoluble bromide of strychnine was produced which settled at the bottom of the liquid. The whole quantity of strychnine in the four ounce mixture was taken at one dose. It is an unfortunate peculiarity of this class of mixtures that the alkaloidal precipitates are not visible at the time the prescription is compounded, but they slowly settle out in the course of a few hours. This would be very likely to escape the notice of any one and on this account the careful pharmacist places a "Shake well" label upon the bottle, so that in case of precipitation, the patient will by shaking the mixture be sure to get the due proportion of alkaloid in each dose.

The writer regrets that space will not permit him to mention many other "exigencies" in prescription practice; but it is a source of gratification that probably at no time in the history of the world have pharmacists been so thoroughly trusted by physicians as at the present. The true pharmacist is always sensitive upon the question of additions or alterations in a prescription and he will never deviate from the rule, to permit no addition or alteration, which will interfere with the obvious intention of the prescriber. But no true physician will object to such alteration or addition if strictly within this rule. It is absolutely impossible for the busy practitioner to retain in his memory the varying degrees of solubilities of the great mass of chemical substances that are used to-day in the treatment of disease. Separation, precipitation, dissociation are almost always the rule. If by the addition of a little acacia, the active resinous ingredient of a tincture is prevented from adhering to the sides of a bottle and made to form a part of a homogeneous mixture; or if through the neutralization of the spirit of nitrous ether, the sodium salicylate in the mixture is held up; or if through the heating of one of the liquids, perfect solution is effected; and if the rule above quoted is never deviated from, then does the pharmacist truly fulfill his mission and become a most efficient co-worker.

Self-interest, lack of sufficient inducement, and liability of discovery are all powerful incentives in keeping the pharmacist who is not amenable to higher motives, from what is called tampering with the physcians' prescriptions. Wherever a deviation from the strict interpretation is demanded, it is the pharmacist's duty to render at once to the prescriber an explanation of the reasons for making any addition or change. As no pharmacist cares to risk the chances of an encounter with the physician, which is often times accompanied by at least unpleasant remarks, it follows that in the vast majority of cases additions and alterations are not only not made, but never suggested, thus it is that many prescriptions are sent out showing evidences of incompatibility, crudeness, and in some cases utter failure in accomplishing the objects of the prescriber.

The policy of "*vis inertiæ*" is, to most compounders the easiest and the simplest to adopt in order to avoid criticism and a possible contest with the physician. If a patient should complain of the unsightliness or inefficiency of a mixture, the reply usually is, "Well, you must not blame me for that. The prescription is compounded exactly as your doctor wrote it." But, brethren of both professions should these things be? Thousands of workers throughout the world are busily employed in wresting the secrets from Mother Nature in the search for some new substance to combat disease. Millions of capital are invested by shrewd earnest men in developing to the utmost the latest discoveries of science, for the use and benefit of the sick and helpless. The members of the medical profession know what sacrifices they have endured, what privations they have suffered, what years of labor it has cost to fit them to practice their profession. On the other hand has not the pharmacist toiled unceasingly, studied unremittingly, and suffered in a similar way from privation and sacrifice to fit him for his profession? Shall all this go for naught? Have not all of these earnest laborers had but one goal—the preparation of remedies for the cure of disease?

What matters it, if millions have been spent in the manufacture of a remedy, if when the supreme object of its existence is reached it falls short or fails of its mission, through the lack of co-operation or of a proper state of feeling between the doctor and the druggist. The educated, hard working pharmacist who faithfully labors to perform all of his duties, is worthy of the support of every physician in his neighborhood; confidence begets confidence and if this is once thoroughly established, the settlement of a "prescription exigency" when it arises becomes a simple problem.

EYE TROUBLES WHICH CONSTITUTE A FREQUENT SOURCE OF HEADACHE, VERTIGO AND NAUSEA, AND OTHER NERVOUS DISORDERS.

Series of four lectures delivered at the Fourth Special Course of the Chicago Policlinic.

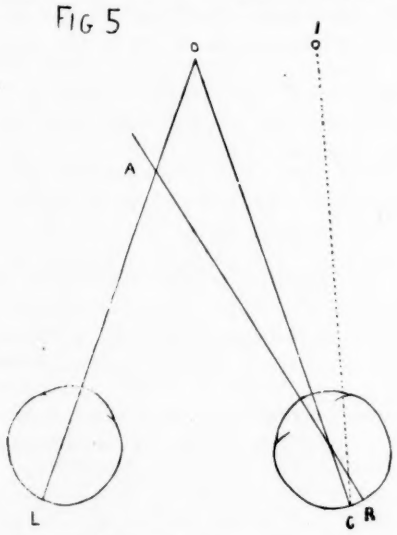
BY F. C. HOTZ, M.D.,
PROFESSOR OF OPHTHALMOLOGY.

LECTURE III.—PARALYSIS AND PARESIS OF THE OCULAR MUSCLES.

In the *third group* of eye troubles which are known to influence the nervous system, we again find the seat of disturbance in the ocular muscles. But the muscular disturbance is of a very different kind from that of the second group. There we found muscular over-activity; here we have to deal with defective muscular action, *paresis and paralysis of the muscles*; there we saw binocular vision maintained, here binocular vision is abolished. The affections of the second group are a particularly frequent source of pain in the head and other neuralgic symptoms; the paralytic affections induce vertigo, confused vision, and nausea, but never any headache or any other neuralgia.

In executing the movements of the eyeballs for the purpose of adjusting the visual lines in the acts of binocular vision the muscles of both eyes act together in sets; and the easy and accurate adjustment of the visual lines require that the same nerve impulse brings forth the same degree of action in the coöperating muscles of either eye. Any loss of action in one muscle results in a limitation of motion of the eye in that direction for which the coöperation of the weakened muscle is chiefly demanded. This limitation of motion causes all the symptoms (both local and general) which characterize the paralytic affection of the eye muscles, and which I will now point out to you in the case before you. It is a case of paralysis of the externus of the right eye; and the first thing which attracts your attention is the convergent squint of the right eye. When the patient wishes to look at an object (*o*) 10 or 15 feet

FIG 5



or further away, the weak externus is unable to turn the right eye sufficiently to connect its visual line with the object. The visual line of the right eye (*r a*) meets that of the left eye at a point (*a*) which is nearer than the object (*o*); or, as we say, the right eye is converging. You therefore see: 1. *The limited motion results in a false position of the visual line, or in strabismus.* This strabismus becomes more marked (that is, the right eye becomes more convergent) when I make the patient turn his eyes to the right, because the paralyzed externus cannot turn the right eye in that direction. But when the patient turns his eyes to the left, the convergent strabismus quickly disappears, the eyes are straight; for the externus of the right eye has to be perfectly relaxed when this eye turns to the left; and therefore, whether paralyzed or not, the externus has no influence upon the position of the visual lines in this direction. This change of the degree of strabismus according to the position of the object (to the right or to the left) is peculiar to squint caused by the paralysis of a muscle (paralytic squint), and distinguishes it from the ordinary form of convergent strabismus where the degree of convergence is the same, whether the eyes are turned right or left or straight ahead.

2. *The false position of the visual line causes diplopia.*—Let this patient look at a light some little distance away, and he will see two lights side by side. Why? Because the right eye being convergent, the image of the light (*o*) is formed on the retina at a point (*c*) lying to the inner or nasal side of the macula (*r*), while the left eye receives the image of the light directly on its macula (*l*). But we see an object as a single object only when its image is produced upon identical points of both retinæ, and this condition not being fulfilled in the case before us, our patient sees the light in its true place (at *o*) with his left eye, and a second light (*ó*) to the right of the other with his right eye; for we are accustomed to refer retinal impressions located to the left side of the macula to objects in space located to the right side of the object we are looking at; or in other words, an image produced on the nasal half of the retina of the right eye (or the temporal half of the retina of the left eye) is projected into space as an object situated at our right side; and *vice versa*, retinal images located to the right of the macula (on the temporal side in the right eye, or on the nasal side in the left eye) are projected back into space as objects situated at our left side.

Diplopia is the most important symptom of paralysis of ocular muscles, because its presence enables us to detect paralytic disturbances even when the resulting deflection of the visual axis (the strabismus) is almost imperceptible to our eyes; and because the double images tell us at once which muscle is at fault.

For the paralysis of every one of the ocular muscles shows the double images in a peculiar configuration different and distinct from their relative positions observed in the paralysis of every other ocular muscle. We, therefore, have as many different configurations of double images as there are ocular muscles; their number is bewildering to the medical student, and the unsystematic way in which they are discussed and treated in the text-books, greatly adds to his confusion. It is no wonder that when he has finished the chapter on ocular paralysis he feels very much like the student in Goethe's Faust,

> "So stupid from all he has read
> As if a mill-wheel whirled in his head;"

and imagines the diagnosis of ocular paralysis one of the most difficult problems to solve.

And yet I say—and I am going to demonstrate it you—the correct interpretation of the diplopia tests is a comparatively easy task, if we only get a little system into our work and have a clear conception of the physiological function of each ocular muscle. In the first place it is, of course, necessary to know at once which of the double images belongs to the right and which to the left eye. For this reason we put a red glass before one eye because the images can then be distinguished by their different colors. Now, if you make it a rule to put the red glass always before the same eye (the right eye), for instance, of the patient, you will soon get so thoroughly accustomed to identify the red light with the right eye, that the relation of the images to the eyes and the question of homonymous or crossed images is decided by you without hesitancy and without any mental effort. We speak of *homonymous images*, if the patient (having the red glass before his right eye) sees the red light to the right of the other, because the image stands on the side of the eye it belongs to; but when the image has crossed over to the other side, when the red light appears to the left of the other, we speak of *crossed images*.

The principal rotations our eyeballs make in the act of seeing are of three kinds: looking sideways, upwards or downwards. Each of these movements is under the control of a different pair of muscles; the lateral movements are controlled by the internus and externus; the upward movements by the superior rectus and inferior oblique; the downward movements by the inferior rectus and superior oblique. Now, any paralytic disturbance of the harmonious coöperation of the muscles in any one set causes diplopia and the images will appear displaced in the line of rotation which this set of muscles controls. If the disturbance affects the lateral movements of eyes, the images appear side by side, and we will call it *lateral diplopia;* if the disturbance occurs in the vertical movements, the images are displaced more or less on a vertical line, and we will call it *vertical diplopia*. This vertical diplopia may occur only when the patient is looking up (vertical diplopia in the upper visual field), or when he is looking down (vertical diplopia in the lower field).

This simple classification of the diplopia tests enables us quickly to trace the paralytic disturbance to one of the three sets of ocular muscles; for lateral diplopia points to the first set (internus and externus); vertical diplopia in the upper field points to the second pair (superior rectus and inferior oblique), and vertical diplopia in the lower field points to the third pair (inferior rectus and superior oblique).

Now, having narrowed down our investigation to one pair of muscles, can we learn also from the diplopia test which muscle of the pair is at fault? Nothing is easier than this; for in each pair the paralysis of the one muscle causes more or less abnormal convergence, while the paralysis of the other muscle causes more or less divergence of the affected eye, and if you bear in mind that paralytic convergence is *always* associated with homonymous diplopia and paralytic divergence *always* with crossed diplopia, you have the unfailing evidence to determine which muscle in the pair is affected. And upon these facts we can prepare the following schedule of the diplopia tests for a quick diagnosis of the paralytic affections of the ocular muscles:

1. *Lateral Diplopia.*
   a. Homonymous images—paralysis of externus.
   b. Crossed images—paralysis of internus.
2. *Vertical Diplopia in Upper Field.*
   a. Homonymous images—paralysis of inferior oblique.
   b. Crossed images—paralysis of superior rectus.
3. *Vertical Diplopia in Lower Field.*
   a. Homonymous images—paralysis of superior oblique.
   b. Crossed images—paralysis of inferior rectus.

Gentlemen, you see this schedule covers all the six ocular muscles, and leads clearly to the muscle which is at fault; the only thing left for completing the diagnosis, is to decide to which eye the faulty muscle belongs. To settle this point we move the light to the right and to left, upwards and downwards and note the changes in the relative position of the images. Let me illustrate this experiment in the case before us. Our patient says he sees two lights on a level and the red light on the right side; according to our schedule, lateral diplopia with homonymous images indicates paralysis of the externus. Now, to find out whether the externus of the right or left eye is at fault, I move the light to the left and the patient declares the images are coming together; he sees only one light; and now I move the light toward the right, and the patient says the two images are getting further away from each other. This experiment shows that the limitation of motion (which causes the false position of the visual line and thereby the diplopia) is manifested when the eyes turn toward the right; and as this rotation is executed by the coöperation of the externus of the right eye and the internus of the left eye, and we know our case is a paralysis of the externus, we now come to the conclusion that the externus of the right eye is the faulty muscle.

3. *The limitation of motion perverts the patient's judgment as to the true position of objects in space.* I will hold this lead pencil pointing to the right in front of the patient and bid him, with his left eye closed, quickly to strike with his right hand the end of the lead pencil. What do you see? He misses the pencil, every time striking too far to the right. And he does it because he believes the pencil to be right there where he strikes down. For we are accustomed to determine the location of an object chiefly by the muscular action required to turn the eye toward the object. The further, for instance, an object is to our right side, the greater is the effort the externus of the right eye has to make to bring its visual line to bear upon the object. The paralyzed externus of our patient expends all energy it has left in the attempt to turn the right eye just a few degrees to the right; but the patient receives the feeling that the externus is making a great effort, and guided by this impression he judges that the eyeball is making a great rotation toward the right, and accordingly concludes the lead pencil must be situated a good way to the right. And if he could not turn the right eye outward at all, the retinal image of the lead pencil would not be received on the macula, but to the nasal side of it, and, by the law of projection the patient would locate it further to the right than it actually is.

4. This perversion in judging the true position of objects, and the diplopia cause the greatest confusion of vision, making it often very difficult for peo-

ple to walk straight and to get along well on a crowded street. They are the causes of the vertigo, (therefore called *visual vertigo*) and all the other nervous symptoms. And as the visual embarrassment is removed as soon as the affected eye is closed, patients are usually very quick in finding this out and relieve themselves of the embarrassing diplopia by wearing a little shade over the faulty eye.

Or they will overcome the difficulty in another peculiar way. You will notice that when this patient is looking at you, his face is not turned squarely toward you, but to his right side. He has found out that when he turns his eyes to the left, the diplopia disappears, and he utilizes this fact to avoid the double images. He turns his face to the right so that the eyes are practically turned to the left, which is looking straight ahead. These peculiar attitudes of the head are very characteristic for the different forms of paralysis.

All the symptoms I have pointed out are well marked only while the paralysis or paresis is recent. After lasting many months the case loses more or less of its typical features. The patient, for instance, learns to suppress the second image, and also learns to correct the error of projection; and hence, he is no longer troubled by visual vertigo and its associated symptoms.

I must not omit, however, to state that I am speaking only of those cases of ocular paralysis caused by extra cranial lesions, and by such intra cranial lesions which have no disturbing influence on the nerve centres. For in a great many instances the ocular paralysis is due to some grave cerebral disease which itself produces vertigo, and the other nervous disturbances I have mentioned as resulting from paralytic affections of the eye muscles. In these cases, of course, the ocular affection is not to be treated as the cause of the nervous symptoms, but must be regarded as a collateral phenomenon.

In conclusion, I wish to state that paralysis attacks some of the eye muscles far oftener than others. In 1871 Professor Graefe collected 328 cases of paralytic affections of the ocular muscles; in 145 cases more than one muscle was affected; in 183 cases the paralysis was limited to one muscle, as follows:

Paralysis of the Externus	105
Obliquus Superior	52
Rectus Inferior	10
Rectus Superior	9
Rectus Internus	5
Obliquus Inferior	2
Total	183

SOCIETY PROCEEDINGS.

American Electro-Therapeutic Association.

Second Annual Meeting, held in New York, October 4, 5 and 6, 1892.

WILLIAM J. MORTON, M.D., PREST.

FIRST DAY, OCTOBER 4—MORNING SESSION.

(*Continued from page 78.*)

Dr. Walker was glad that all did not share Dr. Massey's unfavorable opinion of Apostoli's electrode, for while watching Apostoli at his clinic, he had been pleased with all the instruments in use there. The speaker then referred to a case of a lady who had been referred to him for the removal of the uterine appendages for severe neuralgia. Thinking that her condition did not justify such an operation, he advised electricity, but the patient would not consent to this, and another surgeon performed laparotomy upon her. When the abdomen was opened, no abnormality could be found, and the wound was therefore closed. The moral effect of this operation was to relieve her pain for several months. She then returned to the speaker, and submitted to Apostoli's treatment, and after a few weeks the pain entirely disappeared, and has remained away since then—a period of eighteen months. In connection with the paper just presented, it is particularly interesting to note that the pain in her case was *instantaneously* relieved by the faradic current.

Dr. Canaday remarked that he did not see that Apostoli's electrode differed very much from those commonly made in this country.

Dr. Margaret Cleaves, of New York, said her experience corroborated the statements made by Apostoli concerning the diagnostic value of the galvanic and faradic currents. Apostoli was one of the first to take the position that certain conditions could not be safely treated by the different forms of electricity, and if we all shared this view, there would be less reason for the prejudice which many gynecologists exhibit for electro-therapeutists. In her own practice, she always regarded uterine pain as indicating the necessity for an unusual degree of care in conducting any method of treatment.

Dr. W. F. Hutchinson said that although he had been using high tension currents for the past ten or twelve years for the relief of uterine and ovarian pain, he had not felt that he had accomplished much until quite recently, when he had constructed for him an apparatus capable of giving smooth and very rapid interruptions. By means of tuning forks he had been able to measure the number of vibrations, and had found that they were as high as 30,000 per minute, whereas in the ordinary induction apparatus, the number of vibrations was usually only seven or eight hundred per minute. Now, if the pain is destroyed by a certain faradic current of high tension and rapid vibration, and not destroyed by a smoothly flowing galvanic current, the conclusion is irresistible that the pain is due not an inflammatory process involving metabolic changes, but rather to a misplacement of the polarity of the cells of the body. He had long believed that the human body is made up of cells arranged in sections according to the poles of these sections, and that the passage of a current of sufficient strength reverses these poles, or throws them out of circuit. The theory is a new one, but as the whole subject is so little understood, every theory has its place and some value. The speaker also believed that each current has a distinctly diagnostic value.

The President said that he could not say from personal experience whether or not the fact that an electrical application caused undue pain, indicated the existence of pus in the adjacent tissues, yet he always looked upon this intolerance as a danger signal. Whatever be the cause of these pains, they are relieved by induction currents from coils having very fine windings, and by high oscillations of the static current, when administered either by sparks, or by the induced current from the Leyden jar coatings.

FIRST DAY, OCT. 4.—AFTERNOON SESSION.

G. Betton Massey, M.D., read a paper entitled

A NEW TREATMENT OF PROSTATIC HYPERTROPHY.

A proper presentation of the subject of the electrical treatment of prostatic inflammation and hypertrophy is divisible into several general propositions and statements. The first and most important statement that I wish to impress upon you is that the methods about to be advocated may be relied upon as a successful mode of dealing with

most cases of this troublesome affection. No method is worth the words to describe it unless this is more or less true, yet in this instance the claim of efficiency is specially noteworthy as the affection under consideration is generally regarded as incurable, and condemning its victims to merely mitigated misery for the balance of their days.

The second proposition may be put in the form of the question: Why and how does electricity cure these cases when properly applied? To answer this we must consider the nature of the morbid process and the character of the tissues involved, and apply to these facts the therapeutic deductions derived from the action of electricity in other analogous structures and affections. The prostate gland is a musculo-glandular body, the glandular tissue forming the bulk of its stroma, through which a multitude of muscular fibrils lace and interlace. The glandular tissue is in direct communication by continuity of structure with the glandular lining of the prostatic uretha. The affection under consideration: acute prostatitis and its sequelæ, does not differ essentially from such catarrhal affections as endometritis, rhinitis and other subacute inflammations of glandular mucous membranes; and most probably is caused or accompanied by the same microbic manifestations as those affections. The utility of the direct application of the galvanic current in combating the disease would therefore suggest itself to any one who had observed its value in endometritis. Of the suggestions to be derived from a parallel treatment of rhinitis I shall not now speak beyond mention of a series of experiments now being conducted by the speaker which already prove that nasal catarrh is a field of vast importance to the electro-therapeutist. Mildly cauterant of morbid surfaces and stimulant to the tissue changes of the whole organ, the direct application of the galvanic current to the prostatic urethra is quickly beneficial in changing the character of the morbid process in the glanular tissue. In addition to this resolvent action, another element of remedial power lies in the contractile effect of swelling currents on the muscular fibres so liberally supplied to the organ. It is the development of this constringent power of electric currents in the hypertrophied gland that forms the chief feature of my method, and as it is a most important feature in certain cases I have felt amply justified in designating the method a new treatment, without detriment to the credit due among others, to one of the fellows of this society, Dr. Robert Newman, who has done so much to attract attention to the value of electricity in prostatic disorders. I have seen little or no mention of the prostate as a muscular organ, and a recognition of this important fact is, in my opinion, the keynote to the most successful management of prostatic hypertrophy.

This catarrhal inflammation and hypertrophy are manifested in an organ closely analogous to the uterus, and in its several varieties and consequences, such as hyperplasia proper, true fibrosis, and myo-fibromatous neoplasms, we have almost exactly analogous affections with those occurring in that organ. This being so, it merely follows that the curative treatment must be also analogous. Currents of five and eight milliampéres, while useful in combating the more superficial prostatitis, will not cure the hypertrophies. As in fibroids of the uterus, we must bring the hypertrophied and degenerated organ under the influence of from 20 to 70 ma. This I have done frequently, the active pole, negative, being within the prostatic urethra, and the indifferent pad on the back. The only precautions used, in addition to scrupulous cleanliness of the electrode and gentleness of its insertion, being that the current was not permitted to remain at its strongest figure more than a few seconds as it was turned on and off at the controller to get the greatest constringing action with the least electrolytic irritation. If this be repeated not oftener than five days no irritation will result, but rather a feeling of relief. In the intervals the same current strength is applied daily in the same manner through the rectal wall, the active electrode being an olive of proper size inserted into the rectum and pressed against the prostate, while the indifferent pad is on the abdomen. The primary faradic current should be used after the same method at each sitting, and I am inclined to look on it as an important adjuvant.

Under this treatment the shrinkage of the organ as a whole is soon manifest to the rectal touch, and as soon as a sufficient absorption of morbid products has occurred, with regression of interfering nodules and collars, the power and freedom of micturition will return.

During the progress of the curative treatment the catheter is passed as often as required, the instrument used for treatment serving the purpose of a catheter also at that sitting. Antiseptic flushing of the bladder is also not neglected at such intervals as the condition of the bladder demands.

A point of additional importance in the use of swelling currents of both varieties in prostatic disease is the fact that the expulsive power of the bladder is always below par in these troubles, sometimes overshadowing the condition of the gland itself, and for this condition the treatment described is of great value.

The effect of this treatment is greatest in the symmetrical enlargements of the gland, as it is in this variety that the muscular substance is capable of greatest response. In fibroid nodules in one lobe of the prostrate the older method of continuous application is possibly the best, or we may resort to electro-puncture, though this last resort is undesirable on account of the difficulty of maintaining asepsis.

The instrument shown you is made from a silver catheter with large curve, which has been insulated everywhere with fused hard rubber except a bare surface about two centimeters long just back of the eye. Besides having the advantage of serving as a catheter, and thus saving double instrumentation, the eye at the end serves to notify us of the exact position of the bare spot previous to turning the current on. One of the chief advantages of this form of electrode is the ease with which it may be asepticized by heating in the flame of an alcohol lamp, the same heating permitting us also to repair any breaks that may have occurred in the thin hard-rubber coating of the instrument.

Discussion.

Dr. Rockwell was pleased to hear that the author had obtained such excellent results in the treatment of hypertrophy of the prostate by what must be termed an *ordinary* application of the current, for personally he had never been able to accomplish much by this method, although he had tried various plans of treatment and all sorts of instruments. In connection with this subject, he desired to refer to a unique case which had afforded him an exceptionally good opportunity for observation, from the fact that the patient had had suprapubic cystotomy performed on him. The prostate was enormously enlarged By means of an insulated needle passed through the abdominal opening, the prostate was pierced to the depth of about 1¼ inch, and the gland subjected to a current of from fifteen to thirty milliampères. After several such treatments, the strength of the current was increased to fifty milliampères, and this caused a development of a swollen and very painful testicle, which necessitated a discontinuance of the treatment. Examination after the subsidence of this inflammation showed a positive decrease in the size of the prostate gland, sufficient to allow the patient to pass his urine freely. Subsequently the treatment was resumed, but this time the needle was introduced into the prostate through the rectum.

Dr. Massey, in closing the discussion, said that his experience had been limited to two cases. The first patient was seventy-three years old, and had been unable to micturate for some time. After the treatment this power was regained, and a year or more later, there was still no relapse. In the second case, the current was pushed up to seventy milliampères, and after this treatment, rectal touch showed a decided diminution in the size of the gland.

OPENING OF DISCUSSION ON ELECTRIC CATAPHORESIS.

By Frederick Peterson, M.D., New York.

No definite scientific experiments had been made with electric cataphoresis in its medical aspects, I believe, up to the winter of 1888–1889, when I became interested in the subject while treating some cases of severe trigeminal neuralgia with galvanism. The references to the subject in text-books on medical electricity were meagre and unsatisfactory. Richardson, who in 1859 first called attention to what he termed voltaic narcotism, had subsequently retracted his opinions concerning it and abandoned its use. Adamkiewicz had written much more recently (1886) upon the diffusion of chloroform through the skin by electricity, but his methods had been so criticised and his results so disputed by men of eminence, that the very fact of the existence of such a force as cataphoresis seemed as undecided as ever. My first experiments were very carefully undertaken upon myself to establish to my own satisfaction in a scientific manner the fact or fallacy of anodal diffusion. Experiments and counter-experiments were made, with substances applied to the skin alone, with electricity alone, with drugs upon the cathode, and with drugs upon the anode, and all the details as to the kind of cells, number of cells, duration of application, quantity of electricity, size and character of the electrodes, were carefully recorded in order that there should be no mistake as to the results obtained. Then in order to exclude any error from personal equation, I verified these results upon medical friends and upon patients. The details of many of these experiments I published in my first paper,[1] so that any one who desired could repeat them and satisfy himself as to the truth of the statements I then made. Since then I have verified them over and over, and frequently demonstrated the process with various drugs to students at both the Polyclinic and Vanderbilt clinic, and all of the facts in my first paper and the several other papers I published later[2] have been confirmed and corroborated by many observers who have since taken up the matter of the anodal diffusion of various drugs through the skin or mucous membranes into the tissues. These facts may be briefly stated as follows:

There is, to use a gross figure of speech, a streaming movement of the electric current from the positive to the negative pole, in one direction, sufficiently powerful to carry with it particles of substances in solution through the skin or mucosa.

This property of the current, which we call cataphoresis, is purely physical and is not in any sense electrolytic.

There is no such thing as cataphoresis of a substance placed upon the cathode. The solution of the drug must be placed upon the anode, and the anode only. The process is in every sense an anodal diffusion.

The greater the resistance of the solution to be transfused the more powerful is the cataphoretic effect of the current.

By means of cataphoresis, medicaments may be applied locally to reach certain morbid tissues, to produce absorption, to act as an alterative, to bring about local anæsthesia, to relieve pain in superficial nerves.

For these various purposes many drugs have been employed, such as iodol, iodine, iodide of potash, corrosive sublimate, succinimide of mercury, strychnia, the citrate, benzoate and chloride of lithium, cocaine, chloroform, aconitia, menthol, onabain, strophanthin, carbolic acid, helleborin, atropia and curarin. The details concerning these will be found in previous papers of mine already referred to.

As to methods of administering remedies by means of the anode, there are three: one the bath with the alterative or other agent dissolved in the water of the bath; one the the use of a solution of a drug on any ordinary sponge electrode; and finally for exact dosage the use of the cataphoric electrode made for me by Messrs. Waite and Bartlett. This is merely a metal disc, upon which a disc of tissue paper is laid, and a drop or two of any solution let fall upon the paper. Thus when closely applied to the body there is only a thin film of a known quantity of the medicament between the metal surface and the skin, a fact which greatly accelerates the diffusion. The number of cells or milliampères to be used depends solely upon the sensitiveness of the patient and of the particular part to which the anode is applied. The feebler the current the longer must be the application. The stronger the current the better for rapidity of electrical endosmosis.

This discussion has been arranged for the purpose of bringing the clinical results together of its use in various lines of practice, but very great interest centres also in the nature of the physical process by which substances are thus diffused, and I have invited two eminent electro-physicists, Mr. A. E. Kennelly and Prof. Houston, to deal with this question, that more light may be thrown upon its apparent obscurity and mystery.

ON THE PHYSICS OF CATAPHORESIS.

By A. E. Kennelly, Chief Electrician, Edison Laboratory.

The cataphoric action of electric currents, sometimes named electrical endosmose, whereby a liquid is electrically transfused through a porous septum, was discovered by Reuss in 1807. The history of this phenomenon, with its anomalies and complexities, that for many years baffled analysis and exhausted conjecture, but finally yielded before persistent reseach, is a grand epic, and an interesting episode of the nineteenth century. It was the measurements of Wiedemann, published in 1852, which evinced the principal laws controlling the action, and which were corroborated later by Freund and others. Quinck appears in 1861, to have first given that theory of the subject which was extended and more fully developed by Helmholz in 1879, and which remains in vogue to the present time. The best description and account of cataphoresis is probably to be found in "Die Lehre von der Electricität" Vol. II, Chap. IV (Brunswick 1883), by G. Wiedemann, whose above mentioned researches have had so important a share in the development of the subject.

When two liquids, similar or diverse, are brought into communication through a narrow channel of insulating material—such as a capillary tube of glass, or by a combination of narrow channels in non conducting material, (such as exist in a porous diaphram of earthenware, wood. porcelain, parchment, membrane, etc.) and an electric current is passed from one vessel of liquid to the other, through the tube or diaphram, a flow of liquid generally accompanies the flow of electricity, and in the same direction; that is, from the vessel whose electrical condition is conventionally described as positive, to that which is negative, and the liquid accumulates round the cathode. If the two liquids are dissimilar, there would be a movement in the channel across the common boundary, before the current passes, and due to that diffusion which, as we know, is a property of dissimilar fluids at confluence. Also if in virtue of any

[1] N. Y. Med. Journal, August 27, 1889.
[2] N. Y. Med. Journal, November 15, 1890; N. Y. Med. Record, January 31, 1891; Philadelphia Times and Register, March 21, 1891.

difference of level in the vessels, the liquids were not in equilibrium of pressure at the point of communication, there would be a motion in the tube, or a tendency to restore equilibrium in the ordinary way; but on passing the electric current, it is assumed from experimental results, that the flow due to electrical endosmose is simply superposed upon such diffusional or gravitational currents as may happen to exist. In measurements of electrical transfusion, it is therefore essential that these extraneous influences should be either entirely eliminated, or duly taken into account.

Rare cases have been observed in which the electrical transfusion either opposed the electrical current in direction, passing from the negative to the positive liquid, or assumed the intermediate condition of failing altogether in appearance.

Given a definite porous septum, and liquid in its pores, the total quantity of liquid electrically transferred, depends only on the total quantity of electricity transferred, and at any instant the liquid current is directly proportional to the current of electricity, so that to effect a certain transfer of liquid, a weaker electric current must be sustained for a correspondingly greater time. Wiedemann also showed that the surface of the porous septum, the extent of active surface over which transfusion takes place, does not affect the results, and a current of one ampère will apparently transfer as much liquid cataphorically through one square inch as through twenty square inches of diaphram in the same time. Similarly, the thickness of the diaphram does not come into consideration, and one ampère will carry liquid at the same rate through a plug of plaster of Paris, whether this be five centimetres or five millimetres thick. For any given electrical transfer, however, the liquid transferred depends upon the substance of the diaphram, the size and number of its pores or channels, the nature of the solution, and particularly upon the solution's resistance. With mercury, the effect has not been observed, and with readily conducting liquids the effect is very much reduced, The following cases will exemplify the great difference between the transfusive powers of different liquids under otherwise similar conditions. Two small porous earthenware cells, such as are used in batteries, were partly filled by the writer with a solution of pure zinc sulphate in distilled water to a density of 1.054 at 15° C. Immersed in more of this solution to the same level, outside and in, with zinc plate electrodes, the mean electrical transfusion into and out of the porous cells in four trials was 8.658 c.c., or 9.125 grammes per ampère-hour, or since an ampère is an electrical transfer of one coulomb per second, a transfusion of 2.535 milligrammes of liquid accompanying each coulomb, so that one milliampère would require 109½ hours to transfer one gramme at this rate. The solution's resistivity was approximately 22 ohms at the observed temperature of 20° C., or in other words 22 ohms would be the resistance between parallel faces of one centimetre cube of the solution. With similar porous cells, but employing in place of zinc sulphate solution, distilled water, whose resistivity was found to be 194,000 ohms at nearly the same temperature, the mean observed transfer was at the rate of 5,440 grammes per ampère-hour, or 1.511 grammes to the coulomb, a transfer voluminally 628 times greater than in the previous case. These results are of course relative only, depending upon the particular quality and substance of the porous cells employed.

Wiedemann found the rate of transfusion to be approximately proportional to the resistivity of the aqueous solution of any given salt.

The accepted explanation for cataphoresis is based upon the same electrostatic force and motion by which Thales first discovered, and placed electricity upon record, and by which light particles, pith-balls, gold leaves, etc., are made vehicles of energy, when electrified and brought into the vicinity of electrical charges. It is now a familiar fact that a charge of electricity at rest upon the surface of an insulated body, forms or is associated with an electrostatic circuit. Any other charge of electricity, say a pith ball charge, introduced into the circuit, will be acted upon by an electrostatic force, If the pith ball charge so introduced is relatively so small as not to sensibly disturb the circuit of the original electrification, the force with which the pith ball will be urged along the circuit will at any point be the product of the amount of the pithball charge, (the quantity of electricity it holds,) and the gradient of electrostatic potential at that point. If we imagine that the pith ball holds just one static unit of electricity, the electric force, measured in dynes, urging the ball along the circuital path, is simply the local gradient of potential measured in static units. The geometrical disposition of electrostatic circuits are of course usually complex, as also the distribution of their potentials, so that this force is correspondingly variable from point to point; but we can take an electrostatic circuit of simple geometrical type, one which can also be practically realised with any reasonable degree of accuracy, and here study this action in its native simplicity, when released from the trammels of geometrical complication. Let us take two large plates of metal with plane surfaces, for example two large sheets of glass coated with tinfoil. Let these two plates be clamped by insulators parallel and opposite to one another, at a distance of say five centimetres apart. The geometrical condition of this system of conductors, forming in fact an air condenser, will be uniformly simple at all points between the plates, remote from their edges. Let one plate, A, be electrified to a pressure of say 3,000 volts, while the other, B, is connected to the ground. Then the difference of potential between A and B is 3,000 volts, and if we start from B, where the potential is zero, and move along the perpendicular towards A, the potential will steadily increase as we proceed, at the rate of 600 volts per centimetre, this being the uniform gradient at all points far from the plate edges. Half way across, the potential in the air would be 1,500 volts; and we might graphically depict the system by mapping out 3,000 equidistant, successive, equipotential plane surfaces, between A and B, each differing by one volt and 1-600th, of a centimetre. The electrostatic unit of potential happens to be almost exactly 300 volts, so that in these units, the total difference of potential between the plates is ten, and the rate of fall of potential from A to B, uniformly 2 units per centimetre. If now a unit positive static charge on a small pith ball were introduced between the plates, an electric force of two dynes would be exerted upon it at any point between A and B, distant from the edges, and since a dyne is a force slightly in excess of the earth's gravitational pull upon one milligramme of matter, the electric force on the pith ball would be about 2 milligrammes weight. Similarly if the charge on the pith ball had been eight units, the electrostatic force urging it along the straight line representing the path in the circuit, at the point it then occupies, would be 16 dynes or about 16 milligramme's weight.

A gradient of potential in air to the amount of one volt per centimetre, thus implies an electrice force of 1-300th, of a dyne upon each static unit of electricity there introduced.

(To be continued.)

THE physicians of London average one to each one thousand persons.

THE
Journal of the American Medical Association
PUBLISHED WEEKLY.

SUBSCRIPTION PRICE, INCLUDING POSTAGE:
PER ANNUM, IN ADVANCE $5.00
SINGLE COPIES . . . . . 10 CENTS.

Subscriptions may begin at any time and be sent to
THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,
NO. 68 WABASH AVE., CHICAGO, ILLINOIS.

All members of the Association should send their Annual Dues to the Treasurer, RICHARD J. DUNGLISON, M.D., Lock Box 1274, Philadelphia, Pa.

MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

This is obtainable, at any time, by a member of any State or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues and subscription for THE JOURNAL. Attendance as a delegate at an annual meeting of the Association is not necessary to obtain membership. On receipt of the above amount the weekly JOURNAL of the Association will be forwarded regularly.

SATURDAY, JANUARY 28, 1893.

MEDICAL LEGISLATION.

With a majority of the legislatures in session, medical legislation in different States is assuming renewed activity. About fifteen States remain that are substantially without any legislation whatever. A few others have very inefficient statutes, while the people of about one-half of the whole number of States are protected by very efficient legislation. In casting about for new laws for the regulation of medical practice we desire to suggest the propriety of exercising discretion in the selection of the legislation for submission to the different legislative bodies. It is quite universally conceded that the principles governing ideal legislation are three in number. They are as follows: *First*. All parties wishing to commence the practice of medicine in the various commonwealths should invariably be required to undergo an examination upon all the fundamental branches of medicine. *Second*. Boards should be granted the privilege of refusing and revoking licenses for gross unprofessional or dishonorable conduct. *Third*. There should be defined a minimum of the time to be spent in professional study, including time actually spent at lectures, to entitle the applicant to the privilege of entering upon the examination. Of course, it is understood that the board is to be composed of medical men and granted the same powers that other quite similar State boards possess. In regard to the first principle above mentioned, the rule of individual examination of applicants is the universal practice in every civilized country known to the writer. Individual examination is required in England, Ireland and Scotland, in Germany, France and all the countries of Continental Europe, likewise in Canada and Australia. There are fifteen States of this country that have statutes requiring an individual examination of all applicants. A few State laws permit the recognition of diplomas from colleges in good standing, as entitling the parties to a license to practice. It is an embarrassment to a board to be granted this privilege. The first act regulating practice in Minnesota gave the board this privilege. It was repealed six years ago and a new statute adopted requiring all parties to undergo an examination. The present act in Minnesota is probably the most efficient act regulating medical practice, of any State in the U. S. Ten years' efficient legislation in Minnesota has reduced the proportion of physicians to the population as follows: In 1882 there was one physician to every seven hundred people, while in 1892 there was one to every thirteen hundred. St. Paul has the lowest proportion of physicians to the population of any of the larger cities of this country. In regard to the second principle, the instances demanding its enforcement will be in cases of gross unprofessional or dishonorable conduct, such as occurs in flagrant quackery, persistent inebriety and criminal abortion. A bill is now pending before the Pennsylvania legislature not granting to the board this power. In other respects the proposed bill is quite ideal, however. Under the third principle, the statute should provide a minimum of time to be spent at lectures and in study, before permitting a party to undergo an examination for a license to practice. The necessity of this proviso is quite obvious. Minnesota was the first State to enact this proviso. Its effect has been most salutary. Excuse for its existence will cease with the adoption of the four years' requirement by the colleges of this country. That this time is near at hand there can be little doubt. Commencing with this year's session every college in the United States will require three full courses of lectures before graduation. Now that teachers witness the increased popularity of the high grade schools together with the increased attendance, there will be less lagging in the future. There will be just as many students under the four year course with an income just twice that of former years. There will be a smaller number of schools with a larger corps of instructors.

The new system of instruction demands greater laboratory facilities with increased expenditure for equipment and an increased number of instructors. Its benefits will be phenomenal. We will have with the four year curricula a better class of men entering the profession and men graduating that are very much better equipped for their life work. The result will be a better public service at the hands of the profession. The number of students will probably not lessen with the adoption of the four year course but will probably not increase with the same proportion as in the past. If every college in the country were to adopt the four year course at once, the demand would still remain for the existence of the State regulation of medical practice. The demand for its

existence would be the same as that of the various countries of Europe. It would be a means of stimulating the different colleges to better work, as these boards work are the best channels through which we witness the true character of instruction being afforded the student of medicine by the various colleges of the country. In a question so important to the people and profession, it becomes the duty of the friends of medical legislation to bury prejudices and look at this question in its broadest light. Regarding the *personnel* of the board you should only require that the board be composed of men of experience and good repute in their respective communities.

The question of school of practice cuts little figure. Experience has proven that these representatives of the various schools of practice meet and perform the duty imposed in their trusts without any manifestation of jealousy or friction.

This has been the experience in Illinois, Minnesota, New York, Missouri, Iowa and many other States and will be the experience of States in the future that are vested with the execution of medical legislation.

ENDOWMENTS FOR MEDICAL SCHOOLS.

The subject of medical educational methods is always of interest to physicians, and particularly is such the case at this time, because of the absolute evolution that is taking place, as manifested in the demand made by State Boards of Health, State Boards of Examiners, and the great National Societies, requiring more thorough study on the part of students, and longer courses of instruction given by the colleges.

This condition is brought about by the progress made in our art and science during the past decade.

That the change is not acceptable to a large number of students and to some of the colleges is not surprising, for there are and always will be, an unfortunately large number of aspirants for medical honors, who desire to slip along and through their student life with a minimum of study and of expense.

This is greatly regretted by all right thinking men, for it indicates a lack of appreciation of the work necessarily entered upon by those who propose for themselves a physician's career.

On the part of the colleges which propose to cater to students seeking short terms of instruction, the apology is made that however much they desire to keep step, forward and upward in the march, they cannot financially afford to meet the advance requirements.

Such institutions are in an unenviable dilemma, for they cannot stand still or paddle along in the old beaten paths. They are destined to either fall back into an innocuous dissuetude, or are obliged by the new conditions to gird themselves anew for the exigencies that are before them.

The new conditions imply a provision of the necessary means for creating modern laboratories with accompanying apparatus and accessories of all kinds. Such needed adjuncts, including a trained corps of teachers are to be obtained only through munificent endowments provided and bestowed by those who are bountifully blessed with this world's goods, or by State aid.

Such resources as those named afford the only practical solution of the much discussed medical educational problem.

* * * * *

Endowments or State aid, should only be given to medical schools having a practical relation with a university or academic college, as one of the post graduate departments of such institutions. A nominal affiliation is not a sufficient condition. The one must be an integral part of the other. Such a relation naturally fosters and encourages a suitable preliminary course of study for those who propose entering the medical department, the curriculum of which should be *de facto*, one of the post graduate courses.

Teachers of the Science of Medicine in university medical departments should be paid regular salaries, the same as teachers in other departments, and open prizes offered for results of original research.

Teachers of the Art of Medicine need not necessarily be salaried men, as other emoluments naturally flow in to the occupants of such chairs.

Large endowments have recently been made to the medical department of the University of Pennsylvania, the medical department of the University of California, the medical department of the Columbia University, the medical department of Johns Hopkins University, the medical department of the Western Reserve University, at Cleveland, to the medical department of the Chicago University, the medical department of the Northwestern University, the medical department of Dartmouth, and perhaps others; material, if not munificent State aid, is annually given by the legislature of Michigan to the medical department of the State University; the same may be said of the legislature of Minnesota and perhaps of other States.

Such are the measures necessary for the promotion of the higher grades of medical instruction, and without such substantial foundations, medical colleges, the managers of which are conscious of their shortcomings, must make a change of front, squarely meet the issue that is before them, and show by their works, an honest acceptance of the educational situation.

To the best of our knowledge neither State aid, or financial endowments have ever in any instance been bestowed upon Commercial Medical Colleges, nor is it

likely that we shall be called upon to make mention of such an institution. Moneyed men are usually too shrewd to give of their wealth for such individual aggrandizements.

TENDON ANASTOMOSIS IN INFANTILE PARALYSIS.

In May, 1892, DR. PARRISH, of New York, performed this novel operation. The tendon of the paralyzed extensor pollicis was joined to the tendon of the healthy anterior tibial muscle. Soon after this the child experienced another acute attack of infantile paralysis affecting the posterior tibial muscle. A second operation was done in November, joining the tendon of the posterior tibial to the gastrocnemius. The junction was made with catgut sutures, and the wounds closed without drainage.

DR. A. M. PHELPS, working independently and without knowledge of DR. PARRISH'S experiment, in September, operated in a like manner, joining the tendon of the paralyzed gastrocnemius and soleus to the tendon of the healthy long flexor of the toes.

In both instances a marked gain has been noted. It is possible, then, to join the tendon of a paralyzed muscle to that of a neighboring healthy muscle, closing the wound without drainage, and obtain firm union, an improved position and more or less voluntary control over the movements of the part. So much gain immediately after the operation implies a greater gain as time goes on, in a more equal muscular balance, a diminished tendency to increasing deformity, and a lessened time during which retentive appliances must be used.

THOSE wishing to read papers at Milwaukee in the Section of Obstetrics and Diseases of Women will please send me their application with title of paper at once. Those who are going to read should know it early, and thus have abundance of time to prepare carefully. JOHN MILTON DUFF.

DOMESTIC CORRESPONDENCE.

Revision of the Code of Ethics.

Dear Sir:—"INQUIRER," in his letter to THE JOURNAL of January 21, 1893, does not object to the matter of the Code but "to the form and method employed in giving expression to the precepts which it inculcates." The erudite and scholarly Percival composed his Code of morals at a time when precision in language and in methodical arrangement were as much valued as it is at the present date. The literary taste of the eminent members of the National Association who adapted Percival's maxims to the use of Americans will scarcely be questioned, even by "INQUIRER" whose standard of style and arrangement is apparently so high, when the code is critically examined in respect of the minutest particulars of arrangement and of literary treatment. The writer will not attempt to convince "INQUIRER" who can better satisfy his own doubts by examining the whole subject at leisure. The writer has, however, this request to make in the most respectful tone and with the best motives; to-wit: that "INQUIRER," when he shall have reexamined the manner of the code, will frankly state his convictions whatever they may be. It is gratifying that he so fully endorses the matter of the code and the writer's views, on that part of the subject, expressed in the letter to THE JOURNAL of January 14, 1893. By continuing the analysis of the *News* editorial, the writer will endeavor to adduce sufficient reasons why the Code should not be curtailed on the lines of this editorial in any particular whatsoever.

1. The *News* editorial proposes that the greater part, if not the whole, of the first chapter of the code be suppressed; the reasons alleged being that, like other parts, it is unnecessary, and that there is much in it, "which well deserves the criticism it has received." By this, the author of the editorial probably means to say that the code deserves, and has received reprobative censure. May not the censors have been hasty and unduly severe in their judgment?—Every close student of literature and science knows how difficult it is to form a correct judgment of the merits of some productions even after repeated exhaustive examinations, and that fair, unbiassed, just criticism is not easy to any reviewer, besides being one of the most unenviable tasks. The "well deserved criticism" is a seeming contraction of the author's statement that "the general sense of the profession" is favorable to the Code as it stands. If the general sense of the profession is for retention of the code, surely the censors are in the minority, especially if "IOWA" be correct when he says: "It is safe to affirm that nine-tenths of the profession heartily agree with the views stated by "CONSERVATIVE" in his letter of Dec. 10, 1892." Furthermore, "IOWA" suggests that "every annual meeting in the history of the Association has offered an opportunity to cancel or revise the Code . . . . and that it has retained that freedom from disapproval due to its excellence and origin." The assertion that the Code "contains much that is unnecessary and useless, and that a respectable number of members of the profession demands its revision and are dissatisfied with certain of its provisions," was originally made, even in more peremptory language than this, by a small minority of physicians who rendered themselves ineligible as delegates to the national association. It is seemingly under their inspiration that the proposition was made to revise the Code. Doubtless the association, through the Judicial Council, will give a fair hearing to the plaints of the disaffected, but will probably exercise the right of asking them to state clearly the nature of their grievances, to tell precisely why they are dissatisfied with any of the provisions of the Code, to furnish a logical argument why they consider that certain provisions of the Code should be curtailed or abrogated, to say if they can show that the Code is injurious to the profession and to the public, and, moreover, will probably subject them to the most searching cross-examination. They will be on trial who have disfranchised themselves by refusing to abide by the laws of the Association, and who now wish to dictate terms on which to reenter its portals.

2. The *News* editorial condemns article III, chapter II, of the Code, relating the duties of physicians as respects vicarious offices, on the ground that it refers to a question ordinarily regulated by custom. Most moral laws being based upon good customary practices, the substantive plural morals being derived from *mores*, customs, and ethics from *ethos* custom, it would not be illogical to regard, as essentially ethical, a question regulated by custom. But newly fledged physicians are not supposed to have intuitive knowledge of the customs which regulate professional conduct. They must be supplied with proper information, with a criterion, with a written code of customs. If any reader

should have doubts of the propriety of retaining this, or indeed of any other article of the Code, all these doubts will be speedily removed if he take the trouble to read Doctor Flint's commentaries on the Code.

3. The author of the *News* editorial says that the "Code should clearly and distinctly define the attitude of the profession and provide certain rules for professional conduct." The Code does all this to perfection, and yet he seems disposed to despoil it of much of what he indicates that it should embrace.

4. This same author further says that the eliminations he proposes "would leave the Code with all of its useful provisions and reduce its length more than one-half." He then "throws out as tentative suggestions what seem . . . the most important points." Since he invites free discussion thereon, it may be proper to comply with his wish as well as to strive to answer specifically the question of "INQUIRER" and of others who, from a casual reading, may regard "the tentative suggestions" as representing a highly compressed abstract of the Code. If, however, they re-examine each section of these suggestions and compare it with corresponding provisions of the American code, it is very likely that they will change their views and perhaps think that the Code is short enough and does not contain "unnecessary and useless provisions." The following is the result of a re-examination of the *News*' suggestions.

5. These "tentative suggestions" are divided into seventeen sections, two of which comprising several paragraphs. The first paragraph of Section 1 provides that "every member of the profession knows what constitutes 'a regular or an irregular practitioner, but this should be clearly defined." How can he consistently take this position after asserting that the Code should not include maxims that "go without saying?" According to his own view, if every physician "knows what constitutes a regular or an irregular practitioner" there is no need of stating what every physician knows or what "goes without saying," and his first paragraph should be expunged as unnecessary. A definition of what every physician knows being, according to the editorial, unnecessary and useless, it follows that the second and third paragraphs, which define "a regular and irregular practitioner," are unnecessary and that therefore the whole section is useless.

6. The second section, which is in general accord with the spirit of the Code, is, in letter, entirely too elastic. The explanatory declarations appended to the American code besides being more explicit than this second section, are extremely liberal, both in letter and in spirit, and will surely satisfy all reasonable persons.

7. As physicians instinctively know their duty in cases of emergency, it is an inconsistency on the part of the author of the suggestions to make provision in his third section for such circumstances, if he adheres to his notion of things that "go without saying." Moreover, in the explanatory declarations, which now constitute a part of the Code, there is a wise provision for emergencies in fewer words than are printed in the third section of the "tentative suggestions."

8. Sections 4 to 11 inclusive are certainly no improvements on those of the American code relating to consultations, which contain every necessary detail in letter, and much in spirit. It is, however, gratifying that the author of the editorial has retained the substance of the clauses in the regulations, relating to consultations, which are so much decried by some of those who are "dissatisfied with certain of the provisions" of the Code.

9. Section 12 does not seem to possess any advantage over Section 9 of Article V, Chapter II, of the American code, which contains more necessary matter with only twenty-four words in excess of Section 12 of the "tentative suggestions."

10. Section 13 is very unsatisfactory and insufficient when compared with Section 1 of Article V, Chapter II, of the Code, which contains only nine words more than Section 13, of the suggestions. Section 2 of this sixth article of the Code necessary to the completion of the statement of the law in cases of differences between physicians.

11. Section 14, concerning confidential relations with patients, is not explicit. The provisions embodied in Section 2, of Article I, Chapter I, of the Code, without being unnecessarily long, give clearer, fuller, and better directions than those of the fourteenth section of the suggestions.

12. Nearly all of the eight paragraphs of Section 15 of the "tentative suggestions" are either embodied in the Code or may be regarded as pertaining to its spirit. In respect to newspaper interviews, there is no excuse for the appearance of the name of the interviewed physician. He may give the desired facts to the newspaper correspondent, but on condition that, instead of attaching his name to the document, it be stated: "This information was obtained from a reputable physician." The public is likely to be satisfied when such a declaration appears in a responsible newspaper.

13. Physicians, holding public positions, who regard the spirit of the Code, will not be apt to abuse the privilege accorded by the sixteenth section of the suggestions and, unless their ordinary signature is indispensable in an official document, would be more likely to sign: "The physician in charge, the chief medical officer, or the medical commissioner," just as in the case of the seventeenth section it would be in better taste to sign a bulletin in case of "illness of a public personage:" "By order of the attending physician." These provisions are unnecessary in the letter of an ethical code. The spirit of the Code is likely to be rightly interpreted by high minded physicians, whose arts are not indicative of bad taste or a desire for notoriety.

14. The concluding paragraph of the editorial, referring particularly to the "tentative suggestions," is as follows: "These rules are simple, distinct, and easily understood. If some such code as suggested were adopted by the American Medical Association and recommended for adoption by the different State Societies, it is probable that it would meet the views even of the Medical Society of the State of New York. Should this happy result follow the labors of the committee on revision of the Code of Ethics, it would be difficult to find a logical basis for dissensions on questions of medical ethics." Already it has been shown that these simple, distinct and easily understood rules are not all explicit, and are incomplete, and insufficient for the information of young physicians. It seems to be hoped by the author of the suggestions that the National Code will be abrogated and a new system of ethics recommended for adoption by every State Medical Association, to satisfy the unjust demand of an unreasonable minority, from one State, to the entire disregard of the wishes of all the other States in the Union. The author of the editorial, it seems, would regard this scheme in the light of a happy result, if it should be accomplished! . . . . History has often shown how the most liberal concessions on the part of legislative bodies have failed to satisfy agitators, and history is constantly repeating itself. The explanatory declarations, liberal as they are, do not satisfy the dissenters who do not appear to wish to be conciliated. The National Association, which is not, and cannot be on trial, and is not subject to humiliation, has only to maintain firmly and resolutely its dignified attitude, and pay no other attention to dissenters than to vote them down. The right-minded, able, eminent and reputable members of the profession will surely stand by and continue to perform an abundance of useful work in peace and harmony, and thus preserve to the Association the highest standard of morals and of scientific acquirement.

15. By this examination of the "tentative suggestions," the writer is led to the conclusion that their author has offered, for the American Code, a substitute which cannot, in any respect, be considered as an improvement.

16. It appears that the alleged object of revising the Code is "that it may be liberalized." But not one of the liberalizers has offered substantial proofs that the Code is illiberal in a single particular, or that its teachings are injurious. What then is there to liberalize in moral laws which advocate unbounded freedom to do good, and frown upon evil practices? It is hoped that the Code, so broad, so liberal as it is, will not be converted into a document for granting license to do wrong, and that the vast majorities of physicians, in and out of this great National Association, who love liberty and discountenance license, will unite in their might and put down the existing heresy.

17. It is strange that the author of the *Medical News* editorial should have so misapprehended the situation when at p. 331 of the *News* of September 17, 1892, he said, . . . "but the fact that many of those who, through the State Society, have repudiated the Code, are permanent members . . . . puts the Association in a false and illogical position if their membership be recognized, or excludes certain able consistent, and honest co-workers if the laws of the Association be rigidly enforced." Assuredly he has been misinformed, and this only is accountable for the assertions just quoted. Any person, not entitled to membership, who may arrogantly demand admission on his own terms, will naturally be denied its privileges, but the Association has never and probably will never exclude able, eminent, and honest workers, or honest workers of average ability, or physicians of good repute, who subscribe, in good faith, to the Constitution and Code of Ethics. It is well known that no physician can become a permanent member until he has subscribed to the Constitution and Ethics, and that in signing the registration blank, at the time of a meeting of the Association, the signer thereby subscribes to the ethical code. But if he signs his blank, or any other document relating to membership, with "mental reservation," it is at the sacrifice of self-respect; he must be conscious that he is thus perpetrating a fraud which renders him unworthy of membership. If he subscribes to the American Code and belongs to another society that repudiates this Code for an antagonistic code to which he subscribes, then he is disloyal to both organizations. Those who refuse to abide by the Code while they retain their membership, place themselves, but not the Association, in a "false and illogical position." Those who are not willing to comply with the laws of the Association are not obliged to join, and others, already admitted, who have become dissatisfied with those laws are not forced to continue their membership. The Association has an ample contingent of "able, eminent, and honest workers," and is large and powerful enough to withstand the exodus of all malcontents, turbulent spirits, and disorganizers.

18. The author of the *News* editorial is evidently sincere in what he asserts, but surely he has been wrongly informed, and if he takes sufficient pains to gather more evidence he may perhaps arrive at different conclusions.

19. The facts pertaining to the real situation may be summarized as follows: A minority of physicians, principally of one State, make a peremptory demand that the majority, representing all the other States, shall yield to their mandate; in other words, one State arrogates the right to legislate for all the other States in the Union. That State, which repudiates laws enacted by the consent of each and every one of the other States, insists upon their unconditional surrender. The question is whether they will accede to this imperious command.

A Conservative Member.

ASSOCIATION NEWS.

THE MILWAUKEE MEETING, JUNE 6-9.

The Committee of Arrangements are well organized and give assurance of a thoroughly aroused and interested local profession, and that steps are being taken to make the ensuing meeting a complete success.

The following are the Committees:

EXECUTIVE.

U. O. B. Wingate, M.D., Chairman.
W. H. Washburn, M.D. Sec.
L. H. Montgomery, M.D., (Asst. Sec. A. M. A.).
Wm. Fox, M.D.
Solon Marks, M.D.
Jas. Dorland, M.D.
Samuel W. French, M.D.
Wm. Mackie, M.D.
F. E. Walbridge, M.D.
Jos. Schneider, M.D.
E. Copeland, M.D.
Jas. Cavaney, M.D.
H. V. Wurdemann, M.D.
G. D. Ladd, M.D.
A. B. Farnham, M.D.
L. F. Frank, M.D.
A. J. Puls, M.D.

TRANSPORTATION AND HOTELS.

F. E. Walbridge, M.D., Chairman.
Solon Marks, M.D.
Wm. Mackie, M.D.
Wm. Fox, M.D.
H. M. Brown, M.D.

COMMITTEE ON PLACE OF MEETINGS OF SECTIONS.

Ernest Copeland, M.D., Chairman.
H. V. Wurdemann, M.D.
A. J. Burgess, M.D.
F. J. Tower, M.D.

COMMITTEE ON PRINTING.

H. V. Wurdemann, M.D., Chairman.
R. N. Hawley, M.D.
G. Kamheimer, M.D.
J. S. O'Brien, M.D.

COMMITTEE ON REGISTRATION.

Jas. Cavaney, M.D., Chairman.
Jas. Dorland, M.D.
J. R. McDill, M.D.
A. H. Levings, M.D.
A. Grettinger, M.D.

COMMITTEE ON FINANCE.

Wm. Fox, M.D., Chairman.
Jos. Schneider, M.D.
C. C. Rogers, M.D.
The Chairman to appoint four other members.

COMMITTEE ON ENTERTAINMENT.

S. W. French, M.D., Chairman.
L. F. Frank, M.D.
H. V. Ogden, M.D.
W. A. Batchelor, M.D.
H. E. Bradley, M.D.
J. A. Bach, M.D.
L. Schiller, M.D.
H. P. Wenzel, M.D.

COMMITTEE ON INFORMATION.

A. B. Farnham, M.D., Chairman.
A. J. Puls, M.D.
W. H. Neilson, M.D.
L. G. Nolte, M.D.
J. N. O'Brien, M.D.

COMMITTEE ON EXHIBITS.

U. O. B. Wingate, M.D., Chairman.
W. H. Earls, M.D.
I. J. Hayes, M.D.

COMMITTEY ON R. R. DEPOTS, ETC.

Wm. Mackie, M.D., Chairman.
G. D. Ladd, M.D.
T. H. Hay, M.D.
A. B. Grider, M.D.
Fred Shimonek, M.D.
J. W. Coon, M.D.
J. L. Williamson, M.D.
E. W. Bartlett, M.D.
Ralph Chandler, M.D.

COMMITTEE ON RECEPTION.

Solon Marks, M.D., Chairman, with all the members of the Association residing in the city at the time of the meeting, not appointed on other committees, and such members of the Association residing outside of the city, in the State, not exceeding twelve in number, as the Chairman may select.

COMMITTEE OF LADIES' RECEPTION AND ENTERTAINMENT.

Mrs. Solon Marks, Chairman, with such assistants as she may select.

MISCELLANY.

MEDICAL SOCIETY OF THE MISSOURI VALLEY.—The next meeting of this society will be held in the city of St. Joseph, Mo., March 16, (Thursday) and continue in session one day. Members contributing papers must send titles to the secretary prior to February 25, so they can appear on printed program, mailed March 1. Applications for membership, can be sent to Dr. J. M. Richmond, St. Joseph, Mo. chairman committee of arrangements.

F. S. THOMAS, Secretary.

THE Ninth Annual Meeting of the Fifth District Branch of the N. Y. State Medical Association will be held in Brooklyn on Tuesday May 23, 1893. All Fellows desiring to read papers will please notify the secretary, E. H. Squibb, M.D., P. O. Box 170, Brooklyn.

MEDICAL SOCIETY OF THE STATE OF NEW YORK.—The Eighty-seventh annual meeting of the Medical Society of the State of New York will be held in the City Hall, at Albany, Tuesday, Wednesday and Thursday, February 7, 8, and 9, commencing at 9:15 A.M., on Tuesday and ending at 1 P.M., on Thursday.

The Relation, in the Male and Female, of Genital Disease to Mental and Nervous Affections, by Landon Carter Gray, M.D., New York.

Topic—Epilepsy.

1. The Epileptic Interval; Its Phenomena and their Importance as a Guide to Treatment. William Browning, M.D., Brooklyn.
2. Reflex Disturbances in the Causation of Epilepsy. William C. Krauss, M.D., Buffalo.
3. Mental Epilepsy. J. Montgomery Mosher, M.D., St, Lawrence State Hospital for the Insane, Ogdensburg.
4. The Development of Epilepsy after Traumatic Injury to the Skull. B. Sachs, M.B., New York.

The Treatment of Uræmic Convulsions. R. C. M. Page, M.D., New York.

The Registration of Midwives. J. L. Kortright, M.D., Brooklyn.

Topic—The Relative Value of Certain Obstetrical Operations.

1. General Review of the Operations to be Discussed, by Egbert H. Grandin, M.D., of New York.
2. The Limitations of Embryotomy, by N. Clifton Edgar, M.D., of New York.
3. The Limitations of the Cesarean Section, by Robert A. Murray, M.D., of New York.
4. The Anatomical Limitations of Symphysiotomy, by J. E. Kelly, M.D., New York.
5. The Clinical Limitations of Symphysiotomy, by Chas. Jewett, M.D., Brooklyn.

General Discussion, to be participated in by Drs. E. P. Davis, Philadelphia; H. A. Kelly, Baltimore; H. C. Coe, New York; Reynolds, Boston.

Practical Antisepsis and Asepsis, with stereopticon demonstrations (by invitation), by Howard A. Kelly, Baltimore.

Epitaphs from the Tombstones of Medical History, with stereopticon projections of many old and rare medical portraits, by Joseph H. Hunt M.D., Brooklyn.

Topic—The Management of Suppuration Complicating Tuberculous Disease of the Bones and Joints.

Papers by Drs. V. P. Gibney, of New York; Roswell Park, of Buffalo; Henry Ling Taylor, of New York; and Louis A. Weigel, of Rochester.

Topic—The Present State of Knowledge as to Carcinoma.

1. The Pathology of Carcinoma. H. C. Coe, M.D., New York.
2. The Etiology of Carcinoma. Roswell Park, M.D., Buffalo.
3. The Value of Internal Medication in the Treatment of Carcinoma. Jarvis S. Wight, M. D. Brooklyn.
4. The Results obtainable from the use of Anilin Products in Carcinoma. Willy Meyer, M.D., New York.
5. Caustics in the Treatment of Carcinoma. Daniel Lewis, M.D., New York.
6. The Knife in the Treatment of Carcinoma. N. Jacobson, M.D., Syracuse.

Discussion to be opened by Dr. George R. Fowler, of Brooklyn.

Tubercular Epididymitis, by Herman Mynter, M.D., Buffalo.

Topic—Newer Methods of Diagnosis and Treatment of Stomach and Intestinal Diseases.

1. The Practical Value of the Newer Methods of Examination in the Diseases of the Stomach, with a Consideration of the Indications given for Diet and Treatment by such Examinations, by Henry L. Elsner, M.D., Syracuse.
2. The Methods of Obtaining and Examining the Stomach Contents in Disease for the purposes of Diagnosis, by J. Fuhs, M.D., Brooklyn.
3. The Disturbances of the Motor Function of the Stomach; their Diagnosis, Symptoms and Treatment, by C. G. Stockton, M.D., Buffalo.
4. The Physiological Effects of Electricity in the Stomach, the Indications for its Administration and Use in Gastric Disease, and the Methods of using the same, by Max Einhorn, M.D., New York.

Anniversary address by the President in the Senate chamber.

Topic—The evolution of the American Surgeon.

Report of a Case of Severe Abdominal Injury terminating in Recovery. J. S. Cooley, M.D., Glen Cove.

The Treatment of Inguinal Hernia. Alex. Dallas, M.D., New York.

Certain Types of Septicæmia Resulting from Abortion. Andrew F. Currier, M.D., New York.

Puerperal Sepsis, its Prevention and Cure. Wm. W. Potter, M.D., Buffalo.

Hoarseness. W. Franklin Chappell, M.D., New York.

The Diagnosis and Nomenclature of Fevers. Nelson G. Richmond, M.D., Fredonia.

Congenital Opacities of the Lens. Wm. F. Mittendorf, M.D., New York.

Is Stoerk's Blenorrhoe and Laryngitis Sicca One and the Same Disease? W. Freudenthal, M.D., New York.

The Committee on Credentials will meet at the Delavan House Monday evening, when members and delegates can register.

The committee consists of Dr. Walter B. Chase, of Brooklyn; Dr. Charles M. Culver, of Albany; and Dr. J. P. Creveling, of Auburn.

Communications regarding papers should be addressed to the Business Committee: Dr. Seneca D. Powell, 12 W. 40th St. New York; Dr. William Maddren, 1 Hanson Pl., Brooklyn; Dr. John O. Roe, 28 W. Chester St., Rochester.

OFFICIAL LIST OF CHANGES in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from January 13, 1893, to January 19, 1893.

First Lieut. Thomas A. Raymond, Asst. Surgeon. is relieved from further duty at Vancouver Bks., Washington, and will report in person to the commanding officer, Ft. Canby, Wash., for duty at that station, relieving Capt. Edward C. Carter, Asst. Surgeon, who, on being thus relieved, will proceed to Vancouver Bks., and report in person to the commanding officer of that post for duty there.

Capt. Guy L. Edie, Asst. Surgeon U. S. A., is relieved from duty at Ft. Niobrara, Neb., and will repair to New York City, and report in person to the attending surgeon in that city, for duty in his office.

Capt. Jefferson D. Poindexter, Asst. Surgeon U. S. A., is granted leave of absence for four months.

First Lieut. Samuel R. Dunlop, Asst. Surgeon U. S. A., leave of absence granted is still further extended to include January 31, 1893.

First Lieut. Samuel R. Dunlop, Asst. Surgeon U. S. A., resignation has been accepted by the President, to take effect January 31, 1893.

OFFICIAL LIST OF CHANGES in the Medical Corps of the U. S. Navy, for the Week Ending January 21, 1893.

P. A. Surgeon F. A. Hassler, ordered to receiving ship "Vermont."

Asst. Surgeon George Rothganger, to the Navy Yard, Mare Island, Cal.

Surgeon P. M. Rixey, ordered to the U. S. S. "Dolphin," February 6, 1893.

P. A. Surgeon J. D. Gatewood, detached from the U. S. S. "Dolphin," and granted two months' leave from February 6, 1893.

P. A. Surgeon H. N. T. Harris, to special duty in the Bureau of Medicine and Surgery.

Fig. 1

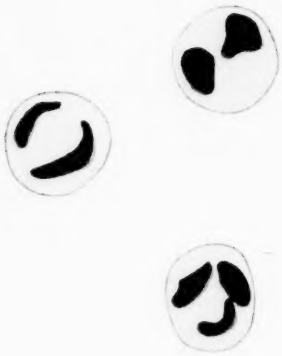


Fig. 7

Fig. 6

Fig. 2

Fig. 3

Fig. 4

Fig. 5